COLLEGE OF PHARMACY

The College of Pharmacy is dedicated to advancing societal health through leadership in pharmacy education, research, community engagement, and improved patient care.

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College of Pharmacy

The College of Pharmacy’s Doctor of Pharmacy (PharmD) Program and PharmD degree are jointly conferred by Oregon State University and Oregon Health & Science University. The Doctor of Pharmacy Program is accredited by the Accreditation Council for Pharmacy Education (http://www.acpe-accredit.org/), 190 S. LaSalle Street, Suite 2850, Chicago, IL 60603-3410, Phone 312-664-3575, Fax, 866-228-2631. Oregon State University College of Pharmacy is a member of the American Association of Colleges of Pharmacy.

A petition from the pharmacists of Oregon led to the establishment of the Department of Pharmacy at Oregon State College in 1898. The department grew steadily and in 1917 became the School of Pharmacy. In 1983, it became the College of Pharmacy.

There are many career options available to individuals having a pharmacy degree. Opportunities for graduates include several different options to provide patient care in community or institutional practice to private consulting and long-term practice settings. The pharmaceutical industry offers careers in many areas including, health professions education, public and government relations, manufacturing, and basic research. Pharmacy graduates are also employed in various local, state and federal health agencies, including the U.S. Public Health Service and the Department of Veterans Affairs. Individuals who decide to pursue advanced professional or graduate training may follow a career in research, advanced patient care settings, and academics.

College of Pharmacy graduates are eligible for licensure as pharmacists throughout the United States.

Pharmacy Information

Professional pharmacy education has advanced both in Oregon and throughout the United States to meet the expectations of an evolving health care system. To be eligible for admission to the PharmD program students complete the PharmD prerequisites, which typically require three to four years of college study. Completion of the pharmacy professional program requires an additional four years.

After completion of the four-year professional pharmacy program, the graduate is eligible to take a licensing exam administered by state boards of pharmacy. After passing the licensing exam, the graduate is licensed to practice as a registered pharmacist. Most graduates become licensed as pharmacists within approximately three months after graduation from Oregon State University.

PharmD Prerequisites

The College of Pharmacy Admissions committee carefully reflects on the overall preparation of each candidate. The profession of pharmacy requires pharmacists to have the knowledge, skills and perspectives necessary to work collaboratively in the provision of outstanding patient care.

Required PharmD prerequisite courses may be taken at Oregon State University or any other accredited college or university. Required courses must be taken for a letter grade; however, an exception may be made if a course is only offered pass/no pass. The student should make a specific request for waiver of grade requirement directly to the College of Pharmacy Admissions Committee prior to taking the course.

Students from community colleges or other colleges and universities can request evaluation of their transcript and planned coursework, if there are questions regarding prepharmacy coursework equivalencies. The PharmD prerequisite (http://pharmacy.oregonstate.edu/pharm-d-prerequisites/) coursework must be completed prior to beginning the professional program.

Early Assurance Program

The Early Assurance Program (https://pharmacy.oregonstate.edu/earloryearly-assurance-program/) provides highly qualified students an opportunity to assure availability of a position in the College of Pharmacy Doctor of Pharmacy (PharmD) program, following completion of admission requirements. Students admitted or enrolled in an accredited community college, college, or university are eligible to apply for the Early Assurance Program. Students accepted into the Early Assurance Program are expected to maintain certain academic criteria, but also engage in professional development opportunities that will enhance readiness for their application to the professional program.
The Professional Pharmacy Program

Enrollment in the four-year professional program is limited. Students must apply for admission (http://www.pharmcas.org/) to the professional pharmacy program. Contact the OSU College of Pharmacy (http://pharmacy.oregonstate.edu/) for other information. Students are admitted to the professional program beginning fall term only.

Once admitted to the professional program, students may register only for those courses for which they have completed the stated prerequisite courses. Exceptions are allowed only after approval by the College of Pharmacy’s Academic and Professional Standards Committee. Students complete the first two years of their course work on the Oregon State University Corvallis campus. The third professional year is at the College of Pharmacy Satellite Campus at Oregon Health and Science University in Portland, Oregon. Most students choose to live in the Portland area during the third year, but a limited number of students may apply to complete part of the didactic coursework in Corvallis using distance technology. The fourth year is off-campus at various pharmacy practice sites throughout the state of Oregon and the Northwest, including Hawaii. Contact the college directly for additional information about the PharmD curriculum.

Immunization and vaccination requirements for PharmD students are stricter than for other university students. PharmD students must satisfy all college immunization and vaccination requirements before starting classes and each year in the program. Failure to meet these requirements may delay enrollment.

The four-year professional pharmacy program provides a broad, scientifically based, clinically focused education. Through appropriate selection of professional elective courses in the fourth year, a student may concentrate in such areas as community, institutional, geriatric, or managed care pharmacy; and prepare for residencies, fellowships, or other post-graduate study.

The pharmacy profession is experiencing profound changes. These changes include an increased focus toward patient care, in addition to the study of pharmaceutical products. All students will be required to give immunizations (shots), take medical histories from patients, and perform physical examinations. These experiences will involve asking sensitive questions and physically touching other people. Throughout the curriculum, students are assigned to off-campus practice sites where they are supervised by licensed pharmacists who are affiliate faculty members of the college. Completion of experiential courses at these off-campus practice sites in the fourth professional year generally requires up to 40 hours per week at the practice site. Experiential courses may include nights, evenings, and weekends. Practice sites are varied but include community pharmacies, hospitals, long-term care facilities, and outpatient clinics. PharmD students are required to provide their own transportation to sites.

The College of Pharmacy requires all pharmacy students to complete criminal background checks and recommends that all pharmacy students submit to drug screening. Criminal background checks and drug screenings have become standard requirements for employment in a pharmacy and placement in experiential rotations. Criminal background checks and drug screening may also be required for licensure. Students who cannot participate in experiential rotations due to criminal or other activities of concern that are revealed in criminal background checks or drug screenings may be unable to fulfill the requirements of the professional PharmD program. Therefore, it is in everyone's interest to resolve any issues prior to commitment of resources by the college and by students.

PharmD students must immediately disclose any criminal activity that occurs prior to or while enrolled in the PharmD program. PharmD students must immediately reveal any action taken by a Board of Pharmacy, including but not limited to warning, probation and revocation of licensure. Failure to do so could result in dismissal from the PharmD program.

To become licensed by the state of Oregon to practice pharmacy, an individual must meet the following criteria:

1. Possess a baccalaureate or PharmD degree in pharmacy from an accredited U.S. college of pharmacy.
2. Pass the North American Pharmacist Licensing Exam (NAPLEX), the Multistate Pharmacy Jurisprudence Examination (MPJE), and

Professional Associations

Students are strongly encouraged to engage in professional development through membership in professional organizations. The Oregon State Student Pharmacists is an umbrella professional development organization for pharmacy students that includes the opportunity to be involved in several national and state professional organizations.

Professional organizations represented at Oregon State University include:

- **American Pharmacist Association, Academy of Students of Pharmacy** leads the profession and equips members for their role as the medications expert in team-based, patient-centered care across all practice settings. The Oregon State Pharmacists Association is the state affiliate of this organization.

- **American Society of Health-System Pharmacists** represents pharmacists who serve as patient care providers in acute and ambulatory care settings. The Oregon Society of Health-System Pharmacists is the state affiliate of this organization.

- **American College of Clinical Pharmacy** is a professional and scientific society that enables clinical pharmacists to achieve excellence in practice, research and education.

- **Academy of Managed Care Pharmacy** supports members to apply clinical evidence, and sound medication management principles and strategies to improve health care for all.

- **American Society of Consultant Pharmacists** represents pharmacy professionals and students devoted to optimal medication management and improved health outcomes for all older adults.

- **College of Psychiatric & Neurologic Pharmacists** is dedicated to providing individuals living with mental illness, including those with substance use and neurologic disorders, appropriate and effective treatment.

- **Industry Pharmacists Organization** supports the interests of industry pharmacists in contributing to the development, commercialization, promotion, and optimal use of medicines.

- **National Community Pharmacists Association** members are dedicated to the continuing growth and prosperity of independent community pharmacy in the United States.

- **Student National Pharmaceutical Association** is affiliated with the National Pharmaceutical Association. This organization is dedicated to...
representing the views and ideals of minority pharmacists and serving healthcare needs of minority communities.

Rho Chi Honor Society—Membership in Beta chapter of Rho Chi, national pharmaceutical honor society, is selective and based on high scholastic achievement.

Phi Lambda Sigma—Membership in the Beta Zeta chapter of the national fraternity is limited to qualified individuals who meet requirements for professional development and leadership.

Phi Delta Chi—Membership in the Beta Iota chapter of this 100-year-old national pharmacy fraternity is limited. Individuals must meet the pledge requirements.

American Association of Colleges of Pharmacy—Any student may apply for membership in this organization that represents members and institutions engaged in pharmacy education in the U.S.

Scholarships and Loans
Information about scholarships and loans is available from the College of Pharmacy website and the Office of Financial Aid and Scholarships, 541-737-2241.

WICHE Program
The College of Pharmacy accepts students supported through the Western Interstate Commission for Higher Education (WICHE) Professional Student Exchange Program. This interstate program provides the opportunity for students from the 12 cooperating states to obtain professional training not available in their home states. Residents from the states of Alaska and Nevada are eligible to apply for support in pharmacy.

To apply, the applicant must become "certified" by their home state. Applicants must apply to their home offices before October 15 prior to the academic year in which they plan to enroll. State certifying office contact information is available online (http://wiche.edu/psep/cert-off/).

Admission Standards
Equal Opportunity and Disability Accommodation
The College of Pharmacy, as a part of Oregon State University, is committed to the principle of equal opportunity. The college does not discriminate on the basis of race, color, creed, religion, national origin, gender, sexual orientation, age, marital status, disability, and disabled veteran or Vietnam-era veteran status. When requested, the college will provide reasonable accommodation to otherwise qualified students with disabilities. Disabled students must work with and be approved by the Disability Access Services office.

Essential Characteristics of Student Pharmacists
The essential characteristics of student pharmacists identified below are drawn from a number of different resources that govern the professional expectations of pharmacists and student pharmacists, including but not limited to the national Pharmacy Code of Ethics, the Oath of a Pharmacist, and the Pledge of Professionalism. Please see Appendices to view these resources. The essential characteristics are intended to ensure that student pharmacists and pharmacists educated at the College of Pharmacy (the "college") have the capacity to meet federal and state regulations and policies that pertain to pharmacy, and to meet or exceed expectations that the public has for professional competence and behavior among pharmacy professionals.

Academic and professional environments present different challenges, but the essential characteristics required to succeed in pharmacy are common to both settings. Students in the college must observe and fulfill the essential characteristics, which have been divided into the following relevant categories: intellectual ability, empathetic and collegial communication skills, psychomotor skills, respect for diversity, high ethical standards, and behavioral and social expectations. Under each category are examples that describe and clarify these essential characteristics.

Intellectual Ability
- Comprehend, interpret and analyze new information
- Reason and carry out evidence-based decision making
- Use critical thinking skills and problem solving to evaluate information from multiple sources and synthesize a plan of action
- Thrive in a rigorous foundational and clinical science-based curriculum
- Participate in self- and programmatic-assessment intended to sustain a continual improvement process
- Be curious and pursue lifelong learning

Empathetic and Collegial Communication Skills
- Formulate concise, accurate synopses of essential information
- Contribute in a meaningful and collaborative manner in group discussions
- Interact constructively with other members of a health care team
- Communicate difficult concepts orally and in writing at an appropriate level for specific patients or audiences
- Listen empathetically and develop rapport
- Appropriately display and interpret nonverbal communication signals
- Communicate fluently in English
- Effectively utilize resources to communicate in non-English languages

Psychomotor Skills
- Participate effectively in preparation and distribution of sterile and non-sterile drug products
- Utilize and analyze information from varied sensory inputs
- Participate in drug administration, including injections
- Carry out tasks required for objective and subjective assessment of patient health
- Discern critical elements of a problem through observation

Students may be able to be admitted and progress to graduation while not possessing selected psychomotor skills. In the instance of a documented disability, the college will work to provide reasonable accommodation. The absence of some skills, however, may limit the variety of settings in which a pharmacist can work.

Respect for Diversity
- Communicate in a manner that respects all individuals
- Proactively seek ways to provide an inclusive environment that addresses unique patient needs
- Provide care without judgment of a patients' personal choices or situation
- Individualize care with consideration of cultural norms for the patient
To begin the first professional year, students must:

- Individualize care with consideration of unique therapeutic needs or challenges

**High Ethical Standards**
- Maintain confidentiality
- Act with compassion, empathy and altruism
- Accept responsibility and provide leadership
- Abstain from illicit drug use
- Act with integrity and expect the same of professional colleagues

**Behavioral and Social Expectations**
- Demonstrate a history of appropriate behavior in personal actions
- Perform effectively and display sound judgment while under stress
- Perform appropriately in academic or professional settings
- Address disagreements with tact and avoid public altercations
- Exhibit the capacity to adapt to change readily and adjust responses in dynamic, unpredictable situations
- Accept constructive criticism and adapt behavior

**Requirements for Progression**

Doctor of Pharmacy (Pharm.D.) students must meet university requirements and standards and adhere to the university Student Conduct Regulations (http://studentlife.oregonstate.edu/studentconduct/). The College of Pharmacy has adopted additional requirements to assure that all pharmacy graduates have the best possible educational background and preparation for their pharmacy practice careers. College of Pharmacy standards may vary from or exceed the university standards in order to ensure compliance with policies, regulations and expectations specific to the pharmacy profession.

Students are expected to meet specific academic and professional requirements to matriculate in the College of Pharmacy and to progress to each successive year of the professional program. Each student's standing is reviewed at the end of every term, or at any time in the interim as determined by the college, including expectations established for background checks and drug screening.

The professional Pharm. D. degree program at Oregon State University is designed to be completed within four years. The program combines didactic courses, structured clinical practice experiences, personal and professional development opportunities and, optimally, significant work experience. Our goal is to educate pharmacists that have a combination of foundational strength, and currency of knowledge and skills that will enable them to be change agents for pharmacy and societal health. 

*In order to assure currency and in-depth knowledge for each graduate, the professional program must be completed within a five year period.*

To advance into the second professional year, students must:

- Successfully complete all courses included in the curriculum of the first professional year with a cumulative pharmacy GPA of 2.00 and a P in all P/N (Pass/No Pass) courses
- Have no more than one D grade in pharmacy courses
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Meet site specific requirements for all assigned experiential rotations
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Have a current Healthcare Provider CPR certification from an approved provider
- Have a current Oregon Pharmacy Intern license

To advance into the third professional year, students must:

- Successfully complete all courses included in the curriculum of the first two professional years with a cumulative pharmacy GPA of 2.00 and a P in all P/N (Pass/No Pass) courses;
- Have no more than one D grade in pharmacy courses
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Meet site specific requirements for all assigned experiential rotations
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Have earned a bachelor's degree
- Have a current Oregon Pharmacy Intern license
- Have a current Healthcare Provider CPR certification from an approved provider

To advance into the fourth professional year, students must:

- Successfully complete all courses included in the curriculum of the first three professional years with a cumulative GPA of 2.00 and a P in all P/N courses
- Have no more than one D grade in pharmacy courses
- Meet all immunization requirements established by the College
- Meet site specific requirements for all assigned experiential rotations
- Verify an understanding and acceptance of College of Pharmacy policies and procedures as they pertain to experiential learning
- Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.
- Have a current Oregon Pharmacy Intern license
• Have a current Healthcare Provider CPR certification from an approved provider

To graduate with the Pharm.D. degree, students must:

• Have met all requirements defined for progression through the first, second, third, and fourth professional years
• Successfully complete all required and elective rotations with a passing grade; and complete all requirements associated with co-curricular (non-credit) activities
• Fulfill the Essential Characteristics of Student Pharmacists identified by the College, including expectations established for background checks and drug screening.

* Concerns revealed in background checks or drug screening which could impact progression will be evaluated on a case-by-case basis. Concerns may also impact progression by preventing licensure or placement in experiential sites

* Experiential sites may require additional background checks and drug screenings

Student Standing in the College of Pharmacy

The Academic and Professional Standards Committee ("APSC") may, at any time, review a student’s standing in the college. APSC is charged with ensuring that students are aware of academic performance or behavior which is not consistent with essential characteristics of student pharmacists and that, therefore, places their completion of the PharmD program at risk. Academic performance and behavioral concerns are often evaluated independently but have equal significance in determining whether a student is meeting the essential characteristics of student pharmacists. Severe, continuing or repeated academic or behavioral problems can result in dismissal from the PharmD program.

APSC, when necessary, provides student standing information to communicate performance deficits, insufficient student progress, and lack of progress in a student addressing academic or behavioral problems. APSC and the college’s director of student services/head advisor provide students guidance regarding what the college expects from a student to increase their opportunities for success in the college. Student performance and progress are evaluated on a case-by-case basis, utilizing the experience of APSC members. APSC uses good faith, informed judgment to determine appropriate recommendations for each student’s situation.

The following student standing notifications may be received by students who are demonstrating performance deficits or insufficient progress in the PharmD program:

Warning

Warning status is cautionary and identifies student performance which may place a student’s completion of the PharmD program at risk.

Students are placed on warning status if they have a term core pharmacy GPA of less than 2.5 or receive 2 or more C grades in core or elective professional courses in a term. Students may also be placed on Warning status if they engage in behavior that does not meet the Essential Characteristics of Student Pharmacists.

• The first time students are placed on Warning status, they must meet with the Director of Student Services/Head Advisor to discuss their situation.
• The second time students are placed on Warning status, they must meet with the Director of Student Services/Head Advisor and develop a holistic action plan for overcoming academic and non-academic barriers to success. They must subsequently execute this action plan.
• The third time students are placed on Warning status, they are automatically placed on Probation.

Probation

Probation status identifies an academic or behavioral concern that places the student’s completion of the PharmD program at serious risk. Probation may be accompanied by a delay in progression at the determination of the APSC.

Students are placed on Probation status if they have a term core pharmacy GPA of less than a 2.0 or if they receive a C– or lower grade in any core or elective professional course. A third warning automatically results in Probation.

Student behavior that is a significant departure from the Essential Characteristics of Student Pharmacists will also result in Probation status. Such behavior includes, but is not limited to, violations of Academic Integrity policies, criminal violations, repeated or intentional violation of college policies, or significant breaches of the University Student Conduct Code (http://studentlife.oregonstate.edu/studentconduct/).

Students on Probation status must follow recommendations of the APSC and the Director of Student Services/Head Advisor. Students on Probation status must meet with the Director of Student Services/Head Advisor following each term to review their progress and standing in the college. Students that successfully fulfill the recommendations prescribed will be removed from Probation status.

Students that fail to follow or are unsuccessful in fulfilling the recommendations will be suspended and evaluated for dismissal from the college. Students who are placed on Probation status for the second time will also be evaluated for dismissal from the college.

Suspension

Students that have failed to make adequate progress, or who have displayed severe or repeated departures from the Essential Characteristics of Student Pharmacists, may be placed on Suspension status. The college will place an indefinite hold on the progression of a student placed on Suspension status until APSC can adequately evaluate whether the student will be allowed to continue in the PharmD program. Students engaged in an appeal of their dismissal from the college will also be placed on Suspension status.

Students placed on Suspension status will not be allowed to progress in the PharmD program. APSC will review the status of a student on Suspension no later than the beginning of the next academic term. After review, APSC may recommend immediate Dismissal from the college recommend that the student be continued on Suspension status pending receipt of additional information, or prescribe a plan to address specific concerns that resulted in the student’s Suspension status. If a plan for progression is developed by APSC, the student will be changed to Probation status. If at any time it becomes evident that the student will not be able to address concerns and graduate within the required five-year window, the student will be dismissed immediately.
Dismissal
Students will be dismissed from the professional program if they are not making adequate academic progress, or if they fail to constructively address professional or behavioral concerns.

Graduate Programs

Majors
- Pharmaceutical Sciences (http://catalog.oregonstate.edu/college-departments/pharmacy/pharmaceutical-sciences-ms-phd/)

Minors
- Pharmaceutical Sciences (http://catalog.oregonstate.edu/college-departments/pharmacy/pharmaceutical-sciences-graduate-minor/)

Professional Programs
- Doctor of Pharmacy (http://catalog.oregonstate.edu/college-departments/pharmacy/pharmacy-pharmd/)

Faculty

Professors Bearden, Block (Emeritus), Christensen (Emeritus), Kioussi, Kradjan (Emeritus), Leid, Mahmud, McPhail, Olyaei, Stevens, Williams, Zabriskie (Emeritus)

Associate Professors Alani, DeLander, Filtz, Furuno, Hartung, Haxby (Emeritus), A. Indra, Irwin, Ishaq-Leid, McGregor, Mullins, Philmus, Proteau, Sikora, Singh, Taratula

Assistant Professors Anderson, Brown, Castner, David, Herink, Lee, S. Ramirez, Sahay, Suchy, Sun, Zumach

Senior Instructor II Zweber

Senior Instructor I Linares

Instructors Chase, Morley, Olstad, Schnabel, Starwalt

Professional Faculty Allison, Alston, Austin Haney, Beaumont, Bookman, Bowers, Clark, Corwin, Davis, Mettie, Ostrogorsky, Peters, J. Ramirez

Research Faculty

Professor, Sr. Research Simonson

Associate Professors, Sr. Research G. Indra, Miranda, Taratula

Assistant Professor, Sr. Research Zielke

Courtesy Faculty and Preceptors

The College of Pharmacy utilizes practicing pharmacists, physicians, and pharmaceutical scientists as lecturers in the professional pharmacy program and in the college's graduate education program. This group includes over 400 pharmacy preceptors that provide individualized guidance for students in Introductory and Advanced Pharmacy Practice Experiences that extend throughout the professional curriculum. All of these individuals make significant contributions to student learning and assure currency of the educational programs in the College of Pharmacy.

PHAR 001, SERVICE LEARNING, 0 Credits

Engage in a service-learning or community engagement experience where skills and knowledge are applied to meet an authentic community-identified need. The experience will integrate meaningful community service with reflection. Through readings and discussions, critically reflect on the service in order to increase understanding of the discipline, gain a broader appreciation of the discipline, enhance a sense of civic responsibility, and strengthen connections with communities.

PHAR 002, LEADERSHIP, 0 Credits

Provides basic personal and interpersonal leadership skills that can be used within and outside of a work setting. Through practice, the leadership experience helps explore motivation, decision-making, time management, power, team building, conflict, ethics, dealing with change, communication skills, and diversity issues.

PHAR 201, PHARMACY ORIENTATION, 1 Credit

Career opportunities in pharmacy including community and institutional practice, government, and industry. Discussion of available educational pathways. Open to non-pharmacy students. Graded P/N.

PHAR 210, TERMINOLOGY OF THE HEALTH SCIENCES, 2 Credits

Provides the student in any of the health science disciplines or pre-professional studies with a working knowledge of the terminology used in the health sciences. Open to non-pharmacy students.

Available via Ecampus

PHAR 401, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.

PHAR 403, THESIS, 1-16 Credits

This course is repeatable for 16 credits.

PHAR 405, READING & CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

PHAR 407, SEMINAR, 1-16 Credits

One-credit section. Graded P/N.

This course is repeatable for 16 credits.

PHAR 501, RESEARCH, 1-16 Credits

This course is repeatable for 16 credits.

PHAR 503, THESIS, 1-16 Credits

This course is repeatable for 999 credits.

PHAR 505, READING & CONFERENCE, 1-16 Credits

This course is repeatable for 16 credits.

PHAR 507, SEMINAR, 1-16 Credits

One-credit section. Graded P/N.

This course is repeatable for 16 credits.

PHAR 525, FOUNDATIONS OF DRUG ACTION I, 3 Credits

Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug absorption and distribution, drug design and characterization of drug interactions with specialized cellular components, and drug biotransformation or excretion.
PHAR 526, FOUNDATIONS OF DRUG ACTION III, 3 Credits
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed.

PHAR 527, FOUNDATIONS OF DRUG ACTION II, 3 Credits
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities.

PHAR 537, BIOORGANIC CHEMISTRY, 3 Credits
A contemporary treatment of the chemistry, enzymology and molecular genetics techniques used in studying major natural products biosynthesis pathways in nature. Offered alternate years. Recommended: (CH 530, CH 531, CH 535) and (BB 590, BB 591, BB 592)

PHAR 547, INFECTIOUS DISEASES AND TREATMENTS, 3 Credits
Introduction to infectious disease processes and antimicrobial agents, including general clinical microbiology, and structure mechanism of action of anti-bacterials and anti-fungal agents. Recommended: Upper level biochemistry

PHAR 548, DRUG ACTIONS IN IMMUNOLOGY AND INFLAMMATION, 3 Credits
Review of foundational concepts in immunology, inflammation and tissue repair, and modification of these processes therapeutically through an understanding and application of anti-inflammatory agents and immune system modulators.

PHAR 563, CANCER AND CHEMOPREVENTION, 2 Credits
A summary of mechanisms of cancer progression, how cancer is detected, and introduction to chemoprevention using targeted therapy and alternative medicine. Recommended: (BB 451 or BB 551) and BI 314 and (BI 460 or BI 560) or second year standing in the PharmD program

PHAR 572, APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS, 3 Credits
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states.

PHAR 573, CURRENT TOPICS IN PHARMACEUTICAL SCIENCES, 1-3 Credits
Critical evaluation of contemporary pharmaceutics and pharmacokinetics research articles. This course is repeatable for 9 credits.

PHAR 574, NANOMEDICINE, 3 Credits
Introduction to the interdisciplinary field of nanomedicine, the use of nanoscale (1-100 nm) phenomena and materials in biomedical applications. Reviews the basic principles of nanotechnology relevant to areas such as diagnostic/molecular imaging, drug delivery, and other novel therapeutics. Topics will be described through both survey of historical developments and the latest scientific developments in the field of nanomedicine.

PHAR 591, PHARMACOLOGY I, 5 Credits
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacological rationale for therapeutic and toxicologic treatment outcomes.

PHAR 592, PHARMACOLOGY II, 5 Credits
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 593, PHARMACOLOGY III, 5 Credits
Principles of pharmacology; molecular, cellular, and physiologic mechanisms of drug action; pharmacologic rationale for therapeutic and toxicologic treatment outcomes.

PHAR 594, ADVANCES IN MANIPULATING THE HUMAN GENOME, 3 Credits
Covers current techniques in genetic engineering used to modify the characteristics of individuals as a prelude to possible future human genetic engineering, including advances in gene manipulation from early recombinant DNA techniques to CRISPR-Cas technology. Emphasizes manipulations of the genomes of individual mammals, and characterization of the effect of those manipulations at levels from the molecular to the physiological. Explores DNA/RNA/protein extraction, polymerase chain reaction, molecular cloning, sequencing (DNA, RNA, and chromatin), expression analyses, gene overexpression, silencing and perturbation. Recommended: Advanced Biochemistry or Cell and Molecular Biology Available via Ecampus

PHAR 601, RESEARCH, 1-16 Credits
This course is repeatable for 99 credits.

PHAR 603, THESIS, 1-16 Credits
This course is repeatable for 999 credits.

PHAR 605, READING AND CONFERENCE, 1-16 Credits
This course is repeatable for 16 credits.

PHAR 606, PROJECTS, 1-16 Credits
This course is repeatable for 16 credits.

PHAR 669, INTRODUCTION TO GRANT PROPOSAL WRITING, 2 Credits
To introduce students to the fundamentals of writing grant proposals to the National Institute of Health (NIH), different funding mechanisms, as well as the grant reviewing process. CROSSSLISTED as PHAR 669/ VMB 669. Equivalent to: VMB 669 This course is repeatable for 20 credits.
PHAR 670, INTRODUCTION TO SYSTEMS BIOLOGY, 2 Credits
Students will gain a high-level overview of systems biology and bioinformatics, with an emphasis on biomedical applications, integration of "omics" approaches, and biological networks.
Equivalent to: VMB 670

PHAR 699, SPECIAL TOPICS IN PHARMACEUTICAL SCIENCES, 3 Credits
This course is repeatable for 99 credits.

PHAR 701, RESEARCH AND SCHOLARSHIP, 1-8 Credits
Research conducted by professional pharmacy students under faculty supervision.
This course is repeatable for 12 credits.

PHAR 703, THESIS, 1-8 Credits
Independent study and analysis that culminates in a thesis.
This course is repeatable for 999 credits.

PHAR 704, RESEARCH SEMINAR, 1 Credit
This course is repeatable for 2 credits.
Recommended: First or second year standing PharmD program

PHAR 705, READING AND CONFERENCE, 1-8 Credits
May be repeated for credit.
This course is repeatable for 12 credits.

PHAR 706, INTRODUCTION TO HEALTH DISPARITIES, 2 Credits
An examination of the multifaceted issue of health disparities in the U.S. healthcare system. Marginalized groups with disparities based upon racial/ethnic, gender, sexual preference and identity, disability, physical and mental health, geography and socioeconomics will be examined at the individual, systematic, and institutional levels.
Recommended: PHAR 707

PHAR 707, CAREER PERSPECTIVES AND PROFESSIONAL DEVELOPMENT, 2 Credits
Students will explore the necessary knowledge, skills and abilities in order to support professional role formation and ongoing professional development. Students will practice skills related to identifying personal strengths and weaknesses, building self-awareness, creating professional job search materials, communicating professionally in written and oral formats, and participating as a team member.
Recommended: First-year standing in the PharmD program

PHAR 708, INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE I, 2 Credits
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 707

PHAR 709, INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: COMMUNITY CARE II, 2 Credits
Students will be placed in community pharmacies for experiential rotations. Students will gain an understanding of the scope of practice and roles of pharmacy personnel while demonstrating skills related to processing and dispensing functions in the community setting. Students will observe patient counseling and have an opportunity to conduct medication reviews to identify any drug-related problems. In-class discussions of patient cases will explore concepts relating to ethical decision-making, cultural sensitivity and coordinated pharmacy practice topics with other first-year courses.
Recommended: PHAR 708

PHAR 711, FUNDAMENTALS OF INTERPROFESSIONAL COLLABORATION, 1 Credit
The first professional year IPE Series is a yearlong course focusing on interprofessional education for students from local colleges (LBCC/OSU/WesternU) representing programs in medical assistant, pharmacy, nursing and osteopathic medicine. Students develop a positive perspective of working with other disciplines, enhanced understanding of their specific role and responsibilities on an interprofessional team, recognize the value of other disciplines providing patient-centered care, and develop a shared accountability for providing patients with safe, high-quality health care.
Recommended: First-year standing in the PharmD program

PHAR 712, FOUNDATIONS OF PATIENT SAFETY AND INTERPROFESSIONAL PRACTICE, 1 Credit
Techniques, best practices and opportunities for improving patient safety through interprofessional teamwork. Graded P/N.

PHAR 713, SPANISH FOR PHARMACY PROFESSIONALS, 2 Credits
For the pharmacy professional with little or no Spanish language background (those with some Spanish language skills would find it beneficial). The course is presented in a video format with in-class facilitator for discussion. Provides basic Spanish grammar instruction but the focus will be on vocabulary and communication in a community pharmacy environment.
PHAR 714, COMPLEMENTARY MEDICINE, 3 Credits
Covers vitamins and microminerals and their role in biochemical processes, maintaining health and preventing disease. The course also covers the etiology of obesity and treatment modalities. The course builds upon the general background of students in biochemistry and physiology to provide a common baseline of knowledge and allow for integration of concepts required to understand preventive medicine. Recommended: PHAR 729 and PHAR 735

PHAR 715, PRESCRIPTION DRUG ABUSE, 2 Credits
Examines the issue of prescription drug abuse among the general population. Graded P/N.

PHAR 717, SENIOR CARE PHARMACY, 2 Credits
Provides an overview of senior care pharmacy practice including an introduction to the senior patient, the senior care healthcare environment, medication-related problems in the elderly, the role of the pharmacist as a member of the interdisciplinary senior healthcare team, and employment opportunities in senior care pharmacy. Graded P/N. Equivalent to: PHAR 721 Recommended: First-year standing PharmD program and PHAR 723 and PHAR 735

PHAR 718, DEVELOPMENT AND MECHANISMS OF ACTION OF CANCER DRUGS, 2 Credits
Analysis of the development and mechanisms of action of cancer chemotherapeutic drugs, with an emphasis on natural product sources for lead compounds and biological targets. Discussion of mainstay cancer drugs illustrates historical, current and emerging cancer drug development paradigms. Provides an understanding of how cancer therapeutic agents have evolved and how they intercept pharmacologic targets. Recommended: Second-year standing in PharmD program

PHAR 719, POISONS AND TOXINS, 2 Credits
Covers many different types of substances, including common household poisons, poisonous plants and mushrooms, toxic gases/metals, shellfish toxins, and other natural toxins. Aspects of the chemistry and pharmacology of the poisons, antidotes/treatments, and occasional case studies will be covered. Historical examples and current events will also be incorporated into the course materials. Equivalent to: PHAR 723 Recommended: PHAR 735

PHAR 720, PHARMACY PRACTICE I: PRINCIPLES OF INTEGRATED PATIENT CARE, 4 Credits
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations. Recommended: PHAR 720

PHAR 721, PHARMACY PRACTICE II, 3 Credits
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations. Recommended: PHAR 720

PHAR 722, PHARMACY PRACTICE III: PRINCIPLES OF INTEGRATED PATIENT CARE, 4 Credits
Pathophysiology of common conditions, self-care therapeutics, clinical data collection and documentation, prescription drug information and education, patient counseling skills, basic pharmacy calculations. Recommended: PHAR 721

PHAR 726, PRINCIPLES OF EVIDENCE-BASED MEDICINE II: DRUG LIT EVAL, 3 Credits
Students will learn to critique and evaluate health-related scientific journal articles using valid established techniques. Recommended: Second-year standing in PharmD program

PHAR 728, PHARMACY LAW, 2 Credits
Introduces the student to the federal and state agencies and regulations that govern pharmacy practice and provides students with foundational knowledge and skills to comply with state and federal regulations. Emphasis will be on regulations from the Food and Drug Administration, Drug Enforcement Administration, and Oregon Board of Pharmacy. Recommended: First year standing in PharmD program

PHAR 729, PRINCIPLES OF EVIDENCE-BASED MEDICINE I: INFORMATION SCIENCE, 3 Credits
Students will learn to identify appropriate information resources and will systematically collect, arrange, and analyze pertinent information related to a particular patient or drug product problem. Equivalent to: PHAR 739 Recommended: First-year standing in PharmD program

PHAR 733, PHARMACEUTICS I, 3 Credits
Foundational perspectives in physical pharmacy with an emphasis on liquid and parenteral products. Properties and processes that influence compatibility and stability in drug formulation are discussed. Varied types of sterile and non-sterile formulations, including product optimization for drug delivery and patient specific considerations, are examined. Recommended: PHAR 735

PHAR 734, PHARMACEUTICS II, 3 Credits
Preformulation and formulation factors affecting the development, production and use of pharmaceutical dosage forms, including ingredients in, and physical, chemical, and biological properties affecting storage, stability, and handling of dosage forms. Lec/lab. Approved for use on a graduate program of study. Recommended: PHAR 733 and PHAR 735
PHAR 735, DRUG ACTION I: MEDICINAL CHEMISTRY AND PHARMACEUTICS, 3 Credits
Introductory course exploring interactions of chemicals with physiological systems. Concepts encompass drug design and characterization of drug interactions with specialized cellular components, drug absorption and distribution, and drug biotransformation or excretion. Approved for a graduate program of study.

PHAR 736, DRUG ACTION III: AUTONOMIC DRUG ACTION, 3 Credits
Drug actions in the autonomic nervous system (ANS) provide a template for understanding drug actions throughout the body. This course provides a complete consideration of pharmacologic and medicinal chemistry principles as they relate to drug interactions with the ANS. Treatment options for selected diseases that respond to drugs acting on the ANS are also addressed. 
Recommended: PHAR 735 and PHAR 737

PHAR 737, DRUG ACTION II: PHARMACOGENOMICS, PHARMACOLOGY & TOXICOLOGY, 3 Credits
Introductory course presenting actions of chemicals on physiological systems. Concepts encompass drug activation of biological response via biochemical or molecular transduction mechanisms, pharmacogenetics and pharmacogenomics, and drug-induced toxicities. Approved for use on graduate program of study. 
Recommended: PHAR 735

PHAR 738, HEALTHCARE SYSTEMS I, 3 Credits
Examination of the U.S. healthcare industry and how it relates to pharmacy. Emphasis is given to changing relationships between healthcare systems, patients, providers of care, hospitals, insurers, employers and the government. 
Recommended: First-year standing in the PharmD program

PHAR 739, HEALTHCARE SYSTEMS II, 2 Credits
Population-based strategies for improving health and wellness with an emphasis on prevention rather than treatment. We will also look at how social determinants of health affect peoples’ ability to be healthy and how the safety net seeks to close the gap for those who have limited access or resources. 
Recommended: PHAR 738

PHAR 740, PHARMACY PRACTICE IV, 3 Credits
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. 
Recommended: PHAR 722 and concurrent enrollment in PHAR 752

PHAR 741, PHARMACY PRACTICE V, 3 Credits
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. 
Recommended: PHAR 740. Concurrent enrollment in PHAR 744 and PHAR 753

PHAR 742, PHARMACY PRACTICE VI, 3 Credits
Basic physical assessment skills and identification of therapeutic endpoints and monitoring parameters for drugs presented in the medicinal chemistry/pharmacology sequence. Students will gain experience in basic physical assessment skills, interviewing skills, history taking, organizing pharmacy notes, and documenting information. 
Recommended: PHAR 741. Concurrent enrollment in PHAR 745 and PHAR 754

PHAR 743, INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: COMMUNITY III, 2 Credits
Students are assigned to community, institutional and ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. 
Recommended: Concurrent enrollment in PHAR 740

PHAR 744, INTRODUCTORY PHARMACY PRACTICE EXPERIENCE: AMBULATORY CARE I, 2 Credits
Students are assigned to institutional or ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. 
Recommended: Concurrent enrollment in PHAR 741 and PHAR 753

PHAR 745, INTRODUCTORY PRACTICE EXPERIENCES: AMBULATORY CARE II, 2 Credits
Students are assigned to institutional or ambulatory care pharmacy settings, and experiences emphasize topics and communication methods covered in the corresponding pharmacy practice course. Graded P/N. 
Recommended: Concurrent enrollment in PHAR 742 and PHAR 754

PHAR 746, PHARMACY MANAGEMENT, 3 Credits
Using a case-based format, students will work in groups to “solve” (using SOAP notes) real-world scenarios based in different pharmacy settings. The cases are organized around the major focus areas listed in the schedule. Each group will present their solution and a recap of the actual outcome will be provided whenever available.
PHAR 747, INFECTIOUS DISEASES AND TREATMENTS, 3 Credits
Introduction to infectious disease processes and antimicrobial agents, including general clinical microbiology, and structure mechanism of action of anti-bacterials and anti-fungal agents. Approved for a graduate program of study.
Recommended: Upper level biochemistry

PHAR 748, DRUG ACTIONS IN IMMUNOLOGY AND INFLAMMATION, 3 Credits
Review of foundational concepts in immunology, inflammation and tissue repair; and modification of these processes therapeutically through an understanding and application of anti-inflammatory agents and immune system modulators. Approved for a graduate program of study.

PHAR 750, PHARMACOKINETICS AND BIOPHARMACEUTICS, 4 Credits
Pharmacokinetics and bioavailability of drugs in clinical care, including changing disease states. Approved for use on a graduate program of study.
Recommended: PHAR 735

PHAR 752, INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS I, 7 Credits
Drug therapy of central nervous system disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 736

PHAR 753, INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS II, 7 Credits
Drug therapy of pulmonary and cardiovascular disorders; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 752

PHAR 754, INTEGRATED DRUG STRUCTURE, ACTION AND THERAPEUTICS III, 7 Credits
Drug therapy of endocrine disorders, and men's and women's health issues; molecular, cellular and physiologic basis of drug action; chemical and physical properties affecting drug metabolism, action and toxicities; treatment options; patient and disease-specific therapeutic considerations.
Recommended: PHAR 753

PHAR 760, INTRODUCTORY PHARMACY PRACTICE EXPERIENCES: INSTITUTIONAL, 2 Credits
Students gain familiarity with the provision of patient centered care through the variety of pharmacy services within a health system. Experiences include introduction to acute care services, transitions of care, and introduction to health systems pharmacy. Emphasis is on learning how to ensure patient medication safety by understanding the process of preparing and distributing medication, collecting and analyzing relevant patient information, and providing guidance regarding medication administration and monitoring.
This course is repeatable for 6 credits.
Recommended: Concurrent enrollment in PHAR 761 and PHAR 764

PHAR 761, ADVANCED INTEGRATED DRUG THERAPY I, 8 Credits
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 764 and PHAR 770

PHAR 762, ADVANCED INTEGRATED DRUG THERAPY II, 8 Credits
Pathophysiologic basis of disease and drug therapy management.
Recommended: Concurrent enrollment in PHAR 765

PHAR 764, PHARMACY PRACTICE VII, 3 Credits
Development of skills for advanced drug therapy problem identification, assessment, and plan resolution for patients with diseases discussed in PHAR 752, 753, 754, 761 and PHAR 762. Students will integrate interviewing, physical assessment, and problem-solving to identify, assess, and resolve drug therapy problems and communicate findings in SOAP notes, care plans, and case presentations.
Recommended: PHAR 742 and concurrent enrollment in PHAR 761

PHAR 765, PHARMACY PRACTICE VIII, 3 Credits
Development of skills for application of didactic learning to case-based drug therapy problem identification, assessment, and plan. Content draws on PHAR 761, and PHAR 762, as well as earlier course work. Students will integrate knowledge from multiple courses to problem-solve drug therapy concerns, and communicate findings both orally and in written format.
Recommended: PHAR 761 and PHAR 764. Concurrent enrollment in PHAR 762

PHAR 767, PRE-APPE READINESS AND COMPLEX CASE ANALYSIS, 3 Credits
Confidence and competence needed for advanced practice settings are enhanced utilizing a mixture of benchmark assessment tools and small case discussions of complex patient cases. The focus is to assure readiness to integrate into inter-professional collaborative health care settings and serve diverse patient populations. Knowledge, skills, attitudes, and professional values are assessed and developed. Formative and summative feedback delivered through faculty, peer and self-evaluation help guide student preparation for advanced experiences and life-long learning. Graded P/N.
Recommended: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773
PHAR 768, ETHICAL AND LEGAL DECISION MAKING, 1 Credit
Student understanding of pharmacy law is assessed, and discussed in the context of pharmacists’ ability to properly respond when legal concepts may not align with ethical decision making in a health profession. Students will apply a framework for ethical decision making and identify personal strategies to maintain currency in pharmacy law and applied ethical decision making.
Recommended: PHAR 760 and PHAR 762 and PHAR 765 and PHAR 773

PHAR 770, ADVANCED PHARMACOKINETICS, 4 Credits
A physiologic approach to understanding advanced pharmacokinetic principles. Approved for use on a graduate program of study.
Recommended: PHAR 750

PHAR 773, EVIDENCE BASED MEDICINE III, 3 Credits
Covering the principles required for evidence-based medicine, including interpreting and applying results from clinical, humanistic, and economic research to medical decision-making.
Recommended: PHAR 726

PHAR 774, EVIDENCE BASED MEDICINE IV, 3 Credits
Covers a variety of topics related to drug policy and drug use management. Population-based strategies to improve drug use will be emphasized along with developing an evidence-based process for evaluating new drugs. A major course project, evaluating a new drug, will focus on application of principles taught in this and previous courses.
Recommended: PHAR 773

PHAR 776, PHARMA-CSI, 2 Credits
Application of PK, PD, and P’genomic concepts, principles, and equations in computer workshops to solve drug therapy misadventures. Approved for use on a graduate program of study.
Recommended: PHAR 770 and third-year standing in the PharmD program

PHAR 777, ACUTE MEDICAL EMERGENCIES, 2 Credits
Drug therapy management in the critically ill patient. Graded P/N.
Recommended: PHAR 762

PHAR 778, ADVANCED ADULT MEDICINE, 2 Credits
Adult medicine elective utilizes actual patient cases to enhance knowledge of pharmacy and the pharmacologic basis of therapeutics in the setting of adult medicine, emphasizing application or current guidelines and major clinical trials for commonly encountered disease states. Graded P/N.
Recommended: Third-year standing in PharmD program and PHAR 761 and PHAR 762 and PHAR 764 and PHAR 765

PHAR 780, COMMUNITY PHARMACY CLERKSHIP, 8 Credits
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information. Graded P/N.
Equivalent to: PHAR 785
This course is repeatable for 32 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 785, AMBULATORY PRIMARY CARE CLERKSHIP, 8 Credits
Supervised advanced professional education in ambulatory care pharmacy practice environment. Emphasis is placed on the application of direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess and monitor pharmacotherapy of acute and chronic diseases in addition to providing drug information to patients and health care professionals. Graded P/N.
This course is repeatable for 32 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 790, GENERAL INTERNAL MEDICINE CLERKSHIP, 8 Credits
Supervised advanced professional education located in internal medicine inpatient pharmacy practice environment. Emphasis is placed on the application of biomedical and pharmaceutical sciences to direct and indirect pharmaceutical patient care and direct interactions with other health care professionals. Students will evaluate, assess, and monitor pharmacotherapy involved in a wide variety of acute and chronic diseases. In addition, students will provide drug information to other health care professionals and patients. Graded P/N.
This course is repeatable for 32 credits.
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 792, HOSPITAL/HEALTH SYSTEMS PATIENT CARE CLERKSHIP, 8 Credits
Supervised advanced professional education located in various hospital or health care systems patient care-oriented settings. Emphasis is placed on application of pharmaceutical sciences and pharmacotherapy to patient care. Graded P/N.
This course is repeatable for 24 credits.
Recommended: Fourth-year standing in the PharmD program
PHAR 795, PATIENT CARE ELECTIVE 
CLERKSHIP, 8 Credits
Supervised advanced professional education located in various patient care-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to direct and indirect pharmaceutical care. Specialties include but are not limited to geriatrics, pediatrics, infectious disease, oncology, general patient care, nutrition support, nuclear pharmacy, home infusion, critical care, anticoagulation, pain management, etc. Graded P/N. 
This course is repeatable for 24 credits. 
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 797, ELECTIVE CLERKSHIP, 8 Credits
Supervised advanced professional education located in various pharmacy-oriented settings. Emphasis is placed on the application of pharmaceutical sciences and pharmacotherapy to a variety of environments involving pharmacy. Specialties include but are not limited to managed care, drug information, administration, pharmaceutical research, pharmaceutical industry, professional pharmacy organizations, etc. Graded P/N. 
This course is repeatable for 24 credits. 
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774

PHAR 798, PHARMACY HEALTH ADMINISTRATION, 8 Credits
Provides students the opportunity to integrate and apply leadership and business principles necessary to operate and manage a pharmacy business or department in a diverse organizational environment. 
This course is repeatable for 16 credits. 
Recommended: PHAR 760 and PHAR 763 and PHAR 766 and PHAR 772 and PHAR 774 and reading and understanding of the Advanced Experiential Manual

PHAR 799, SELECTED TOPICS, 1-16 Credits
This course is repeatable for 16 credits.