Biology Undergraduate Major (BS, HBS)

This major offers the following option(s):

- Genetics (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/genetics-option/)
- Physiology and Behavior (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/physiology-behavior-option/)
- Pre-Dentistry/Biology (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/pre-dentistrybiology-option/)
- Pre-Education Biology (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/pre-education-biology-option/)
- Pre-Medicine/Biology (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/pre-medicinebiology-option/)
- Pre-Veterinary Medicine (http://catalog.oregonstate.edu/college-departments/science/school-life-sciences/integrative-biology/biology-bs-hbs/pre-veterinary-medicine-option/)

Also available at OSU-Cascades.

Administered by the Department of Integrative Biology under the School of Life Sciences.

The undergraduate BS degree in Biology is designed for students seeking an interdisciplinary background in the life sciences. The major couples a comprehensive biological, physical and quantitative sciences core with a variety of electives that can be catered to meet diverse professional goals. Undergraduate research, internship, teaching and study abroad experience are strongly recommended, and credits can be integrated with major requirements. Biology majors receive excellent training for graduate and professional programs.


Major Code: 509

- Explain and apply the fundamental concepts of the biological sciences, including inquiry in these four areas: PO1-A Cell Biology and Biochemistry; PO1-B Molecular Biology and Genetics; PO1-C Organismal Biology; and PO1-D Ecology and Evolution.
- Explain and apply the fundamental concepts in cell biology and biochemistry.
- Explain and apply the fundamental concepts in molecular biology and genetics.
- Explain and apply fundamental concepts in organismal biology.
- explain and apply fundamental concepts in population genetics, evolution and ecology.
- Apply the process of science through three different aspects.
- Access primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
- Formulate testable hypotheses based on observation, gather data to address these hypotheses and analyze those data to assess the degree to which their hypothesis is supported.
- Employ fundamental quantitative and statistical principles to present and critique scientific findings.
- Communicate scientific information through effective formal and informal writing and speaking in a format used by practicing scientists.
- Integrate and analyze information across levels of organization ranging from biochemistry and molecular biology to ecosystems within the biological sciences to formulate arguments and critically evaluate scientific claims.
- Conduct background research and apply fundamental biological science principles to make informed decisions on socio-scientific issues.

Students in the Biology major must complete BI 221, BI 222 and BI 223 (or the honors version of this series) with a C- or better to continue on to upper-division Biology (BI) and Zoology (Z) coursework. Students must also complete CH 231/CH 261, CH 232/CH 262 or CH 233/CH 263 and CH 331 and CH 332 with a C- or better to continue on to upper-division Chemistry (CH) coursework.

Students majoring in Biology cannot seek a dual or double major in Biochemistry and Biophysics, Biochemistry and Molecular Biology, Biohealth Sciences, Microbiology or Zoology.

Declaring an option can modify the statistics and elective areas of the major. For further information, see MyDegrees or the Integrative Biology (http://ib.oregonstate.edu) website.

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<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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<tr>
<td>BI 197</td>
<td>PROFESSIONAL DEVELOPMENT I: HEALTH PROFESSIONS</td>
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<tr>
<td>or BI 198</td>
<td>PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY</td>
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<tr>
<td>BI 298</td>
<td>PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II</td>
<td>1</td>
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</table>
Select one BCC course from the following or see option:
Biology Undergraduate Major (BS, HBS)

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>BI 371</td>
<td>*ECOLOGICAL METHODS</td>
</tr>
<tr>
<td>BI 373</td>
<td>*FIELD METHODS IN MARINE ECOLOGY</td>
</tr>
<tr>
<td>BOT 232</td>
<td>*FLOWERING PLANTS OF THE WORLD</td>
</tr>
<tr>
<td>MB 385</td>
<td>*EMERGING INFECTIOUS DISEASES AND EPIDEMICS</td>
</tr>
</tbody>
</table>

**Experiential Learning or Integrative Biology Elective**

Select one of the following two tracks or an option: 3-4

**Track I Experiential Learning Credits**

Select any combination of three credits from the following:
- BI 309  
  TEACHING PRACTICUM (by approval)
- BI 401  
  RESEARCH AND SCHOLARSHIP (by approval)
- BI 406  
  PROJECTS: CURATORIAL ASSISTANT (by approval)
- BI 409  
  ADVANCED TEACHING PRACTICUM (by approval)
- BI 410  
  INTERNSHIP (by approval)

OSU international internships (INTL credits) by approval

**Track II Integrative Biology Course**

Select one course from the following:
- BI 333  
  & BI 343  
  ADVANCED HUMAN ANATOMY AND PHYSIOLOGY  
  and ADVANCED HUMAN ANATOMY AND PHYSIOLOGY LABORATORY
- BI 353  
  PACIFIC NORTHWEST COASTAL ECOSYSTEMS (taught at Hatfield Marine Science Center)
- BI 358  
  SYMBIOSES AND THE ENVIRONMENT
- BI 375  
  FIELD METHODS IN ECOLOGICAL RESTORATION (taught at OSU Cascades)
- BI 427  
  PALEOBIOLOGY (if not used above)
- BI 450  
  *MARINE BIOLOGY AND ECOLOGY (taught at Hatfield Marine Science Center)
- BI 454  
  EVOLUTIONARY GENOMICS
- BI 456  
  PHYLOGENETICS (if not used above)
- BI 481  
  BIOGEOGRAPHY
- BI 483  
  POPULATION BIOLOGY (if not used above)
- BI 485  
  MONSTER BIOLOGY
- BI 495  
  DISEASE ECOLOGY
- Z 350  
  ANIMAL BEHAVIOR
- Z 361  
  & Z 362  
  INVERTEBRATE BIOLOGY  
  and INVERTEBRATE BIOLOGY LABORATORY (if not used above)
- Z 365  
  BIOLOGY OF INSECTS
- Z 371  
  Vertebrate Biology
- & Z 372  
  and Vertebrate Biology Laboratory (if not used above)
- Z 425  
  EMBRYOLOGY AND DEVELOPMENT (if not used above)
- Z 432  
  VERTEBRATE PHYSIOLOGY II  
  and VERTEBRATE PHYSIOLOGY LABORATORY
- Z 438  
  BEHAVIORAL NEUROBIOLOGY
- Z 473  
  HERPETOLOGY

Total credits required for graduation: 180

* Baccalaureate Core Course (BCC)

& Writing Intensive Course (WIC)

1 Alternative series is ST 351, ST 411 and ST 412

2 Biology majors are required to take BI 498, a comprehensive, two-hour Biology Major Field Test (http://ib.oregonstate.edu/advising/MFT-info/), in their final OSU term (or spring term if they will graduate in summer) in order to graduate

This page contains course information for Biology Undergraduate Major (BS, HBS) students at Oregon State University. The curriculum includes a variety of courses such as Biological Methods, Marine Ecology, Plant Ecology, and more. Experiential learning credits and integrative biology electives are also part of the major requirements. The page outlines various tracks for the major, including Experiential Learning Credits, Integrative Biology Courses, and Baccalaureate Core Courses. Writing Intensive Courses are also required for graduation. The total credits required for graduation are 180. Biology majors must take the Biology Major Field Test in their final term to graduate.
### Third Year

**Fall**
- **BB 450**  
  GENERAL BIOCHEMISTRY  
  Credits: 4
- Select one of the following:  
  - **BI 311** GENETICS  
  - **BB 314** CELL AND MOLECULAR BIOLOGY  
  - **BI 370** ECOLOGY  
  - **PH 201** *GENERAL PHYSICS  
  - Bacc Core  
  Credits: 3-4

**Winter**
- **BB 451**  
  GENERAL BIOCHEMISTRY  
  Credits: 3
- Select one of the following:  
  - **BI 311** GENETICS  
  - **BB 314** CELL AND MOLECULAR BIOLOGY  
  - **BI 370** ECOLOGY  
  - **PH 202** *GENERAL PHYSICS  
  - Bacc Core  
  Credits: 3

**Spring**
- Select one of the following:  
  - **BI 311** GENETICS  
  - **BB 314** CELL AND MOLECULAR BIOLOGY  
  - **BI 370** ECOLOGY  
  - **BI 445** EVOLUTION  
  - **PH 203** *GENERAL PHYSICS  
  - Select one of the following:  
    - Biology and Society  
    - Organisal Biology  
    - Physiology  
    - Writing Intensive Course  
  - Bacc Core  
  Credits: 3

### Fourth Year

**Fall**
- Select one of the following:  
  - **BI 311** GENETICS  
  - **BB 314** CELL AND MOLECULAR BIOLOGY  
  - **BI 370** ECOLOGY  
  - **BI 445** EVOLUTION  
  - **MB 302** GENERAL MICROBIOLOGY  
  - **MB 303** GENERAL MICROBIOLOGY LABORATORY  
  - Select one of the following:  
    - Biology and Society  
    - Organisal Biology  
    - Physiology  
    - Writing Intensive Course  
  - Electives  
  Credits: 3-4

**Winter**
- Select one of the following:  
  - Biology and Society  
  - Organisal Biology  
  - Physiology  
  - Writing Intensive Course  
  - Experiential Learning or Integrative Biology Elective  
  - Electives  
  Credits: 3

**Spring**
- **BI 498**  
  SENIOR BIOLOGY FIELD TEST  
  Credits: 0

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### Biology - TRACK II

**First Year**

**Fall**
- **BI 197**  
  PROFESSIONAL DEVELOPMENT I: HEALTH PROFESSIONS  
  or **BI 198**  
  PROFESSIONAL DEVELOPMENT I: BIOLOGY AND ZOOLOGY  
  Credits: 1
- **BI 221**  
  *PRINCIPLES OF BIOLOGY: CELLS  
  Credits: 4
- **CH 231**  
  GENERAL CHEMISTRY  
  & **CH 261**  
  *LABORATORY FOR CHEMISTRY 231  
  Credits: 5
- Bacc Core  
  Credits: 3
- **HHS 231**  
  *LIFETIME FITNESS FOR HEALTH (or PAC Course)  
  Credits: 1-2

**Winter**
- **BI 222**  
  *PRINCIPLES OF BIOLOGY: ORGANISMS  
  Credits: 4
- **CH 232**  
  GENERAL CHEMISTRY  
  & **CH 262**  
  *LABORATORY FOR CHEMISTRY 232  
  Credits: 5
- Two Bacc Core courses  
  Credits: 6

**Spring**
- **BI 298**  
  PROFESSIONAL DEVELOPMENT FOR BIOLOGISTS II  
  Credits: 1
- **BI 223**  
  *PRINCIPLES OF BIOLOGY: POPULATIONS  
  Credits: 4
- **CH 233**  
  GENERAL CHEMISTRY  
  & **CH 263**  
  *LABORATORY FOR CHEMISTRY 233  
  Credits: 5
- **MTH 251**  
  or **MTH 227**  
  *DIFFERENTIAL CALCULUS  
  or *CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES I  
  Credits: 4
- Bacc Core  
  Credits: 3

**Second Year**

**Fall**
- **CH 331**  
  ORGANIC CHEMISTRY  
  Credits: 4
- **PH 201**  
  *GENERAL PHYSICS  
  Credits: 5
- **MTH 252**  
  or **MTH 228**  
  INTEGRAL CALCULUS  
  or CALCULUS AND PROBABILITY FOR THE LIFE SCIENCES II  
  Credits: 4
- Bacc Core  
  Credits: 3

**Winter**
- Select one of the following:  
  - **BI 311** GENETICS  
  - **BB 314** CELL AND MOLECULAR BIOLOGY  
  - **BI 370** ECOLOGY  
  - **CH 332** ORGANIC CHEMISTRY  
  - **PH 202**  
    *GENERAL PHYSICS  
  - Bacc Core  
  Credits: 3

**Spring**
- Select one of the following:  
  - Biology and Society  
  - Organisal Biology  
  - Physiology  
  - Writing Intensive Course  
  - Experiential Learning or Integrative Biology Elective  
  - Electives  
  Credits: 3

**Electives**
- Credits: 11-15

**Total Credits**
- 180
### Third Year

#### Fall
- **BB 450** GENERAL BIOCHEMISTRY  
  4
- Select one of the following:  
  3-4
  - BI 311 GENETICS
  - BB 314 CELL AND MOLECULAR BIOLOGY
  - BI 370 ECOLOGY
  - BI 445 EVOLUTION
- **ST 351** INTRODUCTION TO STATISTICAL METHODS  
  4
- Bacc Core  
  3
- Credits:  
  15

#### Winter
- **BB 451** GENERAL BIOCHEMISTRY  
  3
- Select one of the following:  
  3-4
  - BI 311 GENETICS
  - BB 314 CELL AND MOLECULAR BIOLOGY
  - BI 370 ECOLOGY
  - BI 445 EVOLUTION
- **ST 352** INTRODUCTION TO STATISTICAL METHODS  
  4
- Bacc Core  
  3
- Credits:  
  14

#### Spring
- Select one of the following:  
  3-4
  - BI 311 GENETICS
  - BB 314 CELL AND MOLECULAR BIOLOGY
  - BI 370 ECOLOGY
  - BI 445 EVOLUTION
- Select one of the following:  
  3
  - Biology and Society
  - Organismal Biology
  - Physiology
  - Writing Intensive Course
- **MB 302** GENERAL MICROBIOLOGY  
  3
- MB 303 GENERAL MICROBIOLOGY LABORATORY  
  2
- Bacc Core  
  3
- Credits:  
  14-15

### Fourth Year

#### Fall
- Select one of the following:  
  3
  - Biology and Society
  - Organismal Biology
  - Physiology
  - Writing Intensive Course
- Bacc Core  
  3
- Electives  
  6-10
- Credits:  
  14

#### Winter
- Select one of the following:  
  3
  - Biology and Society
  - Organismal Biology
  - Physiology
  - Writing Intensive Course
  - Experiential Learning or Integrative Biology Elective  
  3
- Electives  
  6-10
- Credits:  
  14

#### Spring
- **BI 498** SENIOR BIOLOGY FIELD TEST  
  0
- Select one of the following:  
  3
  - Biology and Society
  - Organismal Biology
  - Physiology

### Writing Intensive Course
- Electives  
  8-12
- Credits:  
  14
- Total Credits:  
  180-181
Biology Undergraduate Major (BS, HBS)

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<td>ST 352</td>
<td>INTRODUCTION TO STATISTICAL METHODS</td>
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**Third Year**

**Fall**

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**Winter**

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**Spring**

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<tr>
<td>MB 302</td>
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**Fourth Year**

**Fall**

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**Winter**

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<td>Experiential Learning or Integrative Biology Elective</td>
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**Spring**

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<tr>
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<tbody>
<tr>
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|          | **Total Credits**                          | **180** |