

ECOLOGY, EVOLUTION AND CONSERVATION BIOLOGY

BACHELOR OF SCIENCE IN BIOLOGY

The *Ecology, Evolution, and Conservation* option is for students interested in the origins, maintenance, or conservation of biological diversity. This option prepares students with strong system-level approaches to problem solving, and careers in natural resources and conservation. A strong quantitative background is emphasized, and courses serve to develop skills in data collection, analysis, and communication. It is a degree option that allows students to explore courses offered through the College of Environment and Arts and Sciences.

Each option is complemented by the College of Arts and Sciences general educational requirements such as English Composition, Writing, Foreign Language, QSR, VLPA, and I&S.

Biology Department Admission Requirements

This competitive admission process is designed not to limit access to the major but to assist students in careful planning and preparation for success in the Biology Major. An electronic application can be found on the biology website and will be due the second Friday of Autumn, Winter, Spring, & Summer quarters by 11:59pm.

To apply for a Biology Major you must meet these minimum application requirements:

1. Be a matriculated student at the UW Seattle Campus and in good academic standing.
2. Complete the Introductory Biology series or equivalent courses to UW BIOL 180, 200, 220 and have a minimum grade of 2.0 in EACH course.
3. Have a minimum 2.5 Cumulative GPA for any supporting Chemistry, Physics, Math, Biology or other courses intended for use in the Biology major that are complete at the time of application.

Meeting these minimum requirements does not guarantee admission to the Biology major. Other factors in admission include review of essay questions, space availability in the major, and time to degree set by UW Satisfactory Progress Policy. We strongly encourage students who do not meet the minimum application requirements to meet with a Department of Biology Academic Adviser to discuss their options. If you plan to pursue a double major or degree, a detailed plan for all requirements is required upon admission.

| Academic Advisers | EMAIL | PHONE | Biology Undergraduate Office |
|-------------------|--|----------------|--------------------------------|
| Jason Patterson | patterj@uw.edu | (206) 543-7767 | 318 Hitchcock Hall, Box 355320 |
| Sheryl Medrano | smedrano@uw.edu | (206) 616-8147 | University of Washington |
| Janet Germeraad | janetjg@uw.edu | (206) 543-6647 | Office Phone 206-543-9120 |

Visit the Biology website for dept. info, scholarships, research, etc.: <http://www.biology.washington.edu/>

Appointments: Email adviser directly; each adviser makes their own appointments.

Walk In Advising Hours: Monday, Tuesday, Wednesday, Friday 9:00AM-12:00PM and 1:00PM-4:00PM
Thursday 9:00AM-12:00PM and 1:30PM-4:00PM in 318 Hitchcock Hall

List Serv: Join the Biology listserv: <https://mailman2.u.washington.edu/mailman/listinfo/biostudentMust>
Must be a UW address

Departmental Honors in Biology

Departmental honors allow students seeking extra challenges and opportunities to do so while completing a Biology Degree. Students may request an invitation to departmental honors in Biology once they have been admitted to the Biology Major. The request **must** be submitted *3 quarters* prior to graduation; requests made later will not be reviewed. ***More details about honors can be found in Section VII.***

Option Requirements. A minimum of **90 credits** to be distributed as follows:

I. SUPPORTING COURSES IN CHEMISTRY, PHYSICS, AND MATHEMATICS:

| |
|---|
| Chemistry (choose one option) (15-27 credits) 1. CHEM 120, 220 [^] , 221 (5,5,5) 2. CHEM 142/143, 152/153 [^] (5,5) and CHEM 223, 224 (4,4) (<i>O Chem labs are not required for major</i>) 3. CHEM 142, 152 [^] , 162 [^] (5,5,5) and CHEM 237, 238, 239 (4,4,4) (<i>O Chem labs are not required for major</i>) |
| Physics (choose one option): (9-10 credits) 1. PHYS 114, 115 (4,4) Algebra based physics (<i>labs are not required for the major</i>) 2. PHYS 121, 122 (5,5) Calculus based physics |
| Mathematics (choose one option): For EEC majors, Stats is highly recommended (9-10 credits) 1. MATH 124, 125 (5,5) Calculus with Analytic Geometry 2. QSCI 291, 292 (5,5) Calculus for Biologists (<i>May not be used for the Bio Chem 440 Series</i>) 3a. QSCI 381, 482 (5,5) Quantitative Statistical Reasoning 3b. STATS/QSCI 311, 482 (5,5) Introductory Statistics and Quantitative Statistical Reasoning 4. Combine 1 Stats and 1 Calculus class Calculus (<i>124 or 291</i>) and Statistics (<i>381, 311 or B10ST 310</i>) |
| A third quarter of calculus or a course in probability and statistics is strongly recommended. |

II. INTRODUCTORY BIOLOGY: (15 credits)

| | |
|--|--|
| BIOL 180, 200 [^] , 220 (5,5,5) | [^] CHEM 152, 153 or 220 can be a co-requisite of 200 |
|--|--|

III. GENETICS REQUIREMENT: (3-5 credits)

| | | |
|---|--|--|
| Select one of the following courses: | | |
| 1. GENOME 361 (3) | Fundamentals of Genetics and Genomics | |
| 2. GENOME 371 (5) | Introductory Genetics (<i>Autumn only</i>) | |
| 3. BIOL/FISH 340 (5) | Genetics and Molecular Ecology | |

IT IS YOUR RESPONSIBILITY TO REGULARLY ASSESS YOUR DEGREE PROGRESS BY REFRESHING AND CHECKING YOUR DEGREE AUDIT. SHOULD YOU HAVE A QUESTION OR NOTICE A DISCREPANCY IT IS YOUR RESPONSIBILITY TO ADDRESS THIS WITH A DEPARTMENT OF BIOLOGY ACADEMIC ADVISER.

Scheduling future classes:

Many elective courses have pre-requisite courses.

In planning your courses, be sure to use the course catalog and matrix to plan schedules that include the necessary pre-requisites so you are able to register for your chosen selections!

IV. BREADTH REQUIREMENT:

Biologists often concentrate on one level of biological organization, but it is important to know about broader biological topics that can be studied. To broaden your perspective, you are required to take at least one biologically based course that provides breadth outside your area of concentration that will explore the realm of micro science. ***Breadth is a separate requirement from Advanced Electives.***

Select **one** course:

(3 credits minimum)

| | | | |
|-------------|-----------|-----|---|
| BIOL | 302L | (4) | Lab Techniques in Cellular Molecular |
| BIOL | 310L | (5) | Survey of Human Anatomy |
| BIOL | 313L | (4) | Civilizational Biology |
| BIOL | 350 | (3) | Foundations in Physiology |
| BIOL | 355 | (3) | Foundations in Cell & Molecular Biology |
| BIOL | 360L | (4) | Cellular Anatomy |
| BIOL | 380 | (3) | Biomedical Advances and Society |
| BIOL | 404 | (3) | Animal Physiology: Cellular Aspects |
| BIOL/GENOME | 414L | (5) | Molecular Evolution* |
| BIOL/ESRM | 424L/478L | (5) | Plant Eco-Physiology* |
| BIOL | 425L | (5) | Advanced Plant Physiology and Development * |
| BIOL | 427L | (5) | Biomechanics |
| BIOL | 455 | (4) | Human Immunology & Pathology of Infectious Diseases |
| BIOL | 465 | (3) | Medical Endocrinology |
| BIOL | 467 | (3) | Comparative Animal Physiology |
| MICROM | 301 | (3) | General Microbiology |
| MICROM | 410 | (3) | Fundamentals of General Microbiology |
| MICROM | 442 | (3) | Medical Bacteriology |
| MICROM | 445 | (3) | Medical Virology |

V. NATURAL HISTORY/BIODIVERSITY:

Natural History is the study of the characteristics, life cycles, and biological background of some taxonomic group. Biodiversity deals with a whole suite of organisms that inhabit a particular environment. These classes are often field oriented, in which students both observe or analyze both the organisms and their interactions in the natural habitats.

Natural history is a separate requirement from your Advanced Electives.

Select **one** course:

(3 credits minimum)

| | | | |
|-----------------|-------------|------------|--|
| BIOL | 280 | (4) | The History of Life |
| BIOL/FISH | 311L | (3/5) | Biology of Fishes# |
| BIOL | 317L | (5) | Plant Identification and Classification* |
| BIOL | 397 | (5) | Avian Specimen Preparation |
| BIOL/FHL | 430L | (5) | Marine Zoology (FHL) |
| BIOL/FHL | 432L | (9) | Marine Invertebrate Zoology (FHL) |
| BIOL | 433L | (5) | Marine Ecology* |
| BIOL | 434L | (5) | Invertebrate Zoology |
| BIOL | 437L | (5) | Herpetology* |
| BIOL | 438L | (5) | Analytical Paleobiology |
| BIOL | 439L | (5) | Functional Morphology |
| BIOL | 440L | (5) | General Mycology* |
| BIOL | 441L | (5) | Trends in Land Plant Evolution* |
| BIOL | 442L | (5) | Mushrooms and Related Fungi |
| BIOL | 443L | (5) | Evolution of Mammals and Their Ancestors* |
| BIOL | 444L | (5) | Ornithology* |
| BIOL/FHL | 445L | (5) | Marine Botany (FHL) |
| BIOL | 448L | (5) | Mammalogy* |
| BIOL/ESS | 450/452L | (5) | Vertebrate Paleontology* |
| BIOL/ESS | 451L | (5) | Invertebrate Paleontology* |
| BIOL | 452L | (5) | Vertebrate Biology |
| BIOL | 453L | (5) | Comparative Vertebrate Anatomy |
| BIOL | 454L | (5) | Entomology |
| ESRM | 435/436L | (3/2) | Insect Ecology |
| ESRM | 452L | (3) | Field Ornithology (<i>must be enrolled in 456</i>) |
| ESRM | 453 | (3) | Biology & Ecology of Mammals |
| ESRM | 456 | (3) | Biology and Conservation of Birds |
| FISH | 450L | (3/5) | Salmonoid Behavior and Life History# |
| FISH | 475L | (5) | Marine Mammalogy |

VI. ADVANCED EEC ELECTIVES:

(31 credits)

Within these **31 credits**, students must select one **Conservation**, one **Evolution and Systematics**, and one **Ecology** course.

Note: Many of the courses listed below have pre-requisite courses; in planning your course selection, be sure to include the necessary pre-requisite courses!

| | | | |
|---|----------|--------|--|
| 1. Conservation: Select one course: | | | |
| BIOL | 315 | (3) | Biology Impacts of Climate Change* |
| BIOL | 433L | (5) | Marine Ecology* |
| BIOL | 470 | (4) | Biogeography |
| BIOL | 476L | (5) | Conservation Biology |
| BIOL | 478 | (3) | Topics in Sustainable Fisheries |
| BIOL | 480L | (4) | Field Ecology* |
| ESRM/ENVIR | 371/379 | (5) | Environmental Sociology |
| ESRM | 450 | (5) | Wildlife Ecology and Conservation * |
| ESRM | 456 | (3) | Biology and Conservation of Birds |
| ESRM | 458 | (5) | Mgmt of Endangered, Threatened, and Sensitive Species |
| ESRM | 465 | (3) | Economics of Conservation |
| 2. Ecology: Select one course: | | | |
| BIOL | 315 | (3) | Biological Impacts of Climate Change* |
| BIOL | 423 | (3) | Marine Ecological Processes |
| BIOL | 433L | (5) | Marine Ecology* |
| BIOL | 470 | (4) | Biogeography |
| BIOL | 472L | (5) | Community Ecology |
| BIOL/FISH | 473/474L | (3/2) | Limnology & Lab (<i>Lab is not required</i>) |
| BIOL | 480L | (4) | Field Ecology* |
| BIOL | 481L | (5) | Experimental Ecology and Evolution* |
| ESRM | 450 | (5) | Wildlife Ecology and Conservation * |
| ESRM | 472 | (5) | Wetland Ecology and Management |
| FISH | 464 | (4) | Arctic Vertebrate Ecology |
| 3. Evolution and Systematics: Select one course: | | | |
| BIOL | 317L | (5) | Plant Identification and Classification* |
| BIOL/ GENOME | 414L | (5) | Molecular Evolution* |
| BIOL | 415 | (3) | Evolution and Development* |
| BIOL | 420 | (4) | Game Theory in Biology |
| BIOL | 437L | (5) | Herpetology* |
| BIOL | 440L | (5) | General Mycology* |
| BIOL | 443L | (5) | Evolution of Mammals and their Ancestors* |
| BIOL | 441L | (5) | Trends in Land Plant Evolution* |
| BIOL | 444L | (5) | Orinthology* |
| BIOL | 447L | (5) | Greening the Earth |
| BIOL | 448L | (5) | Mammalogy* |
| BIOL | 449 | (5) | Applied Phylogenetics |
| BIOL/ESS | 450/452L | (5) | Vertebrate Paleontology* |
| BIOL/ESS | 451L | (4) | Invertebrate Paleontology* |
| BIOL | 469 | (3) | Evolution and Medicine |
| BIOL | 481L | (5) | Experimental Evolution and Ecology* |
| BIOL | 475L | (3-5) | Intensive Field Experience in Biology (<i>Wilson only</i>) |
| Electives: Remaining courses to total 31 elective credits may be selected from the lists above, below and/or additional classes on <i>the Natural History/Biodiversity list</i> . Other 300 or 400 courses may be petitioned for approval. <i>Please see a Biology adviser.</i> | | | |
| BIOL | 305 | (3) | Science Communication: Video Storytelling in Biology |
| BIOL | 354 | (3) | Foundations in Evolution and Systematics |
| BIOL | 356L | (3) | Foundations in Ecology |
| BIOL | 396 | (1-4) | Peer Facilitation in Biology ¹ |
| BIOL | 399 | (2-12) | Biology Internship Program |
| BIOL/PSYCH | 408 | (4) | Neuroethology |
| BIOL | 417 | (3) | Comparative Reproductive Physiology of Vertebrates |

VI. ADVANCED EEC ELECTIVES, *continued*:

| | | | |
|----------------------|-----------|--------|---|
| BIOL | 418 | (3) | Biological Clocks and Rhythms |
| BIOL | 419 | (4) | Data Science for Biologists |
| BIOL | 421L | (4) | Ecological and Evolutionary Physiology of Animals |
| BIOL | 422 | (3) | Behavior of Plants |
| BIOL/ESRM | 424L/478L | (5) | Plant Eco-Physiology* |
| BIOL | 425L | (5) | Advanced Plant Physiology and Development |
| BIOL | 438L | (5) | Quantitative Approaches to Paleobio, Morph, & Systematics |
| BIOL | 462 | (3) | Advanced Animal Physiology |
| BIOL | 463L | (3) | Advanced Animal Physiology Lab |
| BIOL | 483 | (1-3) | Sr. Seminar in Paleobiology |
| BIOL | 486 | (1-3) | Senior Seminar in Ecology |
| BIOL | 489 | (1-3) | Sr. Seminar in Plant Biology |
| BIOL | 492 | (3) | Teaching Biology Inclusively to Diverse Audiences |
| BIOL | 495 | (2) | Biology of Fermentation |
| ATMS | 211 | (5) | Climate and Climate Change ² |
| ATMS | 321 | (3) | Physical Climatology ² |
| BIO A | 387 | (5) | Ecol. Perspectives on Environ. Stress, Adaptation, & Health |
| BIOA | 473 | (5) | Biological Adaptability of Human Populations |
| BIOA | 477 | (3) | Evolutionary Perspectives on Sex & Gender Roles |
| BIOA | 482 | (5) | Human Population Genetics |
| ENV H | 405 | (3) | Toxic Chemicals and Human Health |
| ENVIR/ANTH | 459 | (5) | Culture, Ecology and Politics (<i>Policy based</i>) |
| ENVIR/POL S | 384 | (5) | Global Environmental Politics (<i>Policy based</i>) |
| ESRM | 250 | (5) | Intro to Geographic Info. Systems in Forest Resources |
| ESRM | 411 | (3) | Plant Propagation: Principles, and Practice |
| ESRM | 412 | (3) | Native Plant Production |
| ESRM | 415 | (5) | Terrestrial Invasion Ecology* |
| ESRM | 430 | (5) | Remote Sensing of the Environment |
| ESRM | 441L | (5) | Landscape Ecology |
| ESRM | 455 | (1) | Wildlife Seminar |
| ESRM/FISH | 457/455L | (3/5) | Fish and Wildlife Toxicology |
| ESRM | 459 | (3) | Wildlife Conservation in NW Ecosystems |
| ESRM | 470 | (5) | Natural Resource Policy and Planning (<i>Policy based</i>) |
| ESRM | 473 | (5) | Restoration in North America |
| ESS | 210 | (5) | Physical Geology ³ |
| ESS | 211 | (5) | Physical Processes of the Earth ³ |
| ESS | 315 | (5) | Environmental Earth Science |
| FISH | 323 | (5) | Conservation and Management of Aquatic Resources |
| FISH | 324L | (3/5) | Aquatic Animal Physiology and Reproduction [#] |
| FISH | 330 | (5) | Climate Change Impacts on Marine Ecosystems |
| FISH | 406L | (5) | Parasite Ecology |
| FISH | 441L | (3/5) | Integrative Environmental Physiology [#] |
| FISH | 444L | (5) | Conservation Genetics |
| FISH | 447 | (3) | Watershed Ecology and Management |
| FISH/QSCI | 454 | (5) | Ecological Modeling |
| MICROM | 435 | (3) | Microbial Ecology |
| GEOG | 360 | (5) | Principles of GIS Mapping |
| POL S | 383 | (5) | Environmental Politics & Policy in the US (<i>Policy based</i>) |
| PSYCH | 300 | (5) | Animal Behavior |
| PSYCH | 416 | (5) | Animal Communication |
| PSYCH | 419L | (5) | Behavioral Studies of Zoo Animals |
| QSCI | 480 | (3) | Sampling Theory for Biologists |
| QSCI | 483 | (5) | Statistical Inference in App. Research II: Regression Analysis |
| QSCI | 486 | (5) | Experimental Design |
| Various Depts | 499 | (1-10) | Undergraduate Research |

¹ Labs are separate from lecture and not required. When taken, combination counts as one area requirement.

² Only 1 of ATMS 211 or 321 counts toward the major.

³ Only one of ESS 210 or 211 counts toward the major.

VII. LAB, RESIDENCY AND 400 LEVEL BIOLOGY REQUIREMENTS:

These requirements may overlap with other requirements such as Breadth, Natural History/Biodiversity, or Advanced Electives.

- A minimum of **15 credits** must be 400 level through the **Department of BIOLOGY**. Courses such as Biochemistry (BIOC) and Microbiology (MICROM) are from other departments and **will not** count toward this requirement.
- A minimum of **15 credits** of 300 and 400 level Advanced **BIOL** Electives must be taken in residency at the University of Washington-Seattle campus. This requirement **can be shared** with the departmental 400 level requirement above.
- At least **two** laboratory courses, chosen from any course marked with an “**L**”, must be taken. A minimum of four credits of 499 (**please read end note about approval process**) can substitute for one laboratory.

VIII. DEPARTMENTAL HONORS REQUIREMENTS:

General Requirements for completing Departmental Honors include:

- UW Cumulative GPA: 3.3
- Major Cumulative GPA: 3.4
- Complete two 400 level BIOL courses for Ad Hoc credit (*Requires online agreement form*)
- Complete two approved Senior level BIOL Seminars
- Complete 9 credits of Undergraduate Research (*Research approval form required*)
- Complete a research paper based on approved research credits
- Present your research work at the Undergraduate Research Symposium or other approved venue

IX. ADDITIONAL NOTES:

- A cumulative GPA of a 2.0 is required for all classes counting toward the major that are taken at the University of Washington.
- Courses listed in more than one category **can only count for one area requirement**.
- Cross Campus equivalencies are not guaranteed outside the BIOL 180/200/220 and Genome equivalents. Complications may arise during registration if you have taken courses at other campuses and it is up to the student to inquire and be prepared. You will need to submit a petition for any other courses from the other campuses.
- **Experiential learning:** A maximum of total of 10 credits of a combined **396/399/498/499** can be applied to your degree. You will need a faculty code from your faculty sponsor to sign up for any of these credits.
- **Undergraduate Research:** Any 499 credit **must** be approved by petition; see a Biology Adviser or visit the website for a Research Approval Form. A minimum of 4 credits on the same project are required for a petition to count towards a lab.
- *For other classes of interest that are not listed, please contact an advisor about the possibility of petitioning. The course will need to be at the 300 to 400 level and have a biological basis to be considered.*

X. SYMBOLS:

* Indicates course that can only count in one area.

(**FHL**) Indicates course taught at Friday Harbor Labs.

¹ This class is regulated and administered by professor permission. To Peer facilitate an introductory course, contact the lab coordinator of the specific class. For other courses, prior experience with the class and permission of acting instructor is necessary for enrollment.

Indicates a class that has a lecture only (3 credits) or a lecture and lab component (5 credits).