

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. If you did not earn a 2.0 in each of your Biology Intro courses and a cumulative GPA of 2.5 in prerequisite course work needed to apply to Biology, or if you have academic issues to explain that are larger than a single course or quarter, please see an academic adviser to address these issues prior to application. 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.

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/biostudent>

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) (15-26 credits) 1. CHEM 120, 220*, 221 (5,5,5) 2. CHEM 142, 152* (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 (4,4,3) (<i>O Chem labs are not required for major</i>)
Physics (choose one option): (8-10 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 (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 (124 or 291) and Statistics (381,311 or BIOST 310)
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)	<i>*CHEM 220, is a prerequisite for BIOL 200 or CHEM 152 can be a co-requisite of 200.</i>
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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 (<i>Autumn only</i>)	

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	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	411	(4)	Developmental Biology
BIOL/GENOME	414L	(5)	Molecular Evolution*
BIOL	415	(3)	Evolution and Development*
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
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/ESRM	331	(5)	Landscape Plant Recognition
BIOL/FHL	430L	(5)	Marine Zoology (FHL)
BIOL	433L	(5)	Marine Ecology*
BIOL	434L	(5)	Invertebrate Zoology
BIOL	437L	(5)	Herpetology*
BIOL	438L	(5)	Quantitative Approaches to Paleo, Morph, & Systematics
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	456	(3)	Biology and Conservation of Birds
FHL	432L	(9)	Marine Invertebrate Zoology (FHL)
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 ⁴
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	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 Systematics
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
BIOL	418	(3)	Biological Clocks and Rhythms

VI. ADVANCED EEC ELECTIVES, *continued*:

BIOL	419	(3)	Data Science for Biologists
BIOL	421	(3)	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	489	(1-3)	Sr. Seminar in Plant Biology
BIOL	492	(3)	Teaching Biology Inclusively to Diverse Audiences
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 ³
ESRM	411	(3)	Plant Propagation: Principles, and Practice
ESRM	412	(3)	Native Plant Production
ESRM	430	(5)	Remote Sensing of the Environment ³
ESRM	441L	(5)	Landscape Ecology
ESRM	455	(1)	Wildlife Seminar
ESRM/FISH	457/455	(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 ⁵
ESS	211	(5)	Physical Processes of the Earth ⁵
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	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 ³
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	()	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 Classes that develop specific Technical skills

⁴ 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 breath, 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: Only a total of 10 credits of **396/399/496/498/499** can be applied to your degree.
- **Undergraduate Research**: Ten credits is the maximum number of Undergraduate Research credits that can be used as Upper Division Electives. Any 499 credit **may** be approved by petition; see a Biology Adviser for a Research Approval Form. Four of these 10 credits may also be used to fulfill 1 of the 2 lab requirements provided a minimum of 4 credits are completed on the same project.
- *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).