The *Physiology* option emphasizes physiological processes from cellular to organismal levels. This is an attractive option for students interested in the internal processes of both animals and plants in relation to the systems and components that create a working living organism.

*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.

<table>
<thead>
<tr>
<th>Academic Advisers</th>
<th>EMAIL</th>
<th>PHONE</th>
<th>Biology Undergraduate Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jason Patterson</td>
<td><a href="mailto:patterj@uw.edu">patterj@uw.edu</a></td>
<td>(206) 543-7767</td>
<td>318 Hitchcock Hall, Box 355320</td>
</tr>
<tr>
<td>Sheryl Medrano</td>
<td><a href="mailto:smedrano@uw.edu">smedrano@uw.edu</a></td>
<td>(206) 616-8147</td>
<td>University of Washington</td>
</tr>
<tr>
<td>Janet Germeraad</td>
<td><a href="mailto:janetjg@uw.edu">janetjg@uw.edu</a></td>
<td>(206) 543-6647</td>
<td>Office Phone 206-543-9120</td>
</tr>
</tbody>
</table>

Visit the Biology website for dept. info, scholarships, research, etc.: [http://www.biology.washington.edu/](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/biostudent](https://mailman2.u.washington.edu/mailman/listinfo/biostudent)

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 and 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:

<table>
<thead>
<tr>
<th>Chemistry (choose one option) (15-27 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CHEM 120, 220^, 221 (5,5,5)</td>
</tr>
<tr>
<td>2. CHEM 142/143, 152/153^ (5,5) and CHEM 223, 224 (4,4) (O Chem labs are not required for major)</td>
</tr>
<tr>
<td>3. CHEM 142, 152^, 162 (5,5,5) and CHEM 237, 238, 239 (4,4,4) (O Chem labs are not required for major)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physics (choose one option): (8-10 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PHYS 114, 115 (4,4)</td>
</tr>
<tr>
<td>2. PHYS 121, 122 (5,5)</td>
</tr>
</tbody>
</table>

Algebra based physics (labs are not required for the major)
Calculus based physics

<table>
<thead>
<tr>
<th>Mathematics (choose one option): (9-10 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MATH 124, 125 (5,5)</td>
</tr>
<tr>
<td>2. QSCI 291, 292 (5,5)</td>
</tr>
<tr>
<td>3a. QSCI 381, 482 (5,5)</td>
</tr>
<tr>
<td>3b. STATS/QSCI 311, 482 (5,5)</td>
</tr>
<tr>
<td>4. Combine 1 Stats and 1 Calculus class</td>
</tr>
</tbody>
</table>

Calculus with Analytic Geometry
Calculus for Biologists
Quantitative Statistical Reasoning
Introductory Statistics and Quantitative Statistical Reasoning
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) |

^CHEM 152, 153 or 220 can be a co-requisite of 200

III. GENETICS REQUIREMENT: (3-5 credits)

<table>
<thead>
<tr>
<th>Select one of the following courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GENOME 361 (3)</td>
</tr>
<tr>
<td>2. GENOME 371 (5)</td>
</tr>
</tbody>
</table>

Fundamentals of Genetics and Genomics
Introductory Genetics (Autumn only)

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 macro science. *Breadth is a separate requirement from your Advanced Electives.*

Select one of the following courses: (3 credits minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 313L</td>
<td>4</td>
<td>Civilizational Biology <em>(Summer Only)</em></td>
</tr>
<tr>
<td>BIOL 315</td>
<td>3</td>
<td>Biological Impacts of Climate Change</td>
</tr>
<tr>
<td>BIOL 354</td>
<td>3</td>
<td>Foundations in Evolution and Systematics</td>
</tr>
<tr>
<td>BIOL 356L</td>
<td>3</td>
<td>Foundations in Ecology</td>
</tr>
<tr>
<td>BIOL/BIO A</td>
<td>385/355</td>
<td>Evolutionary Medicine and Public Health</td>
</tr>
<tr>
<td>BIOL 415</td>
<td>3</td>
<td>Evolution and Development</td>
</tr>
<tr>
<td>BIOL 420</td>
<td>4</td>
<td>Game Theory in Biology</td>
</tr>
<tr>
<td>BIOL 423</td>
<td>3</td>
<td>Marine Ecological Processes</td>
</tr>
<tr>
<td>BIOL 438L</td>
<td>5</td>
<td>Analytical Paleobiology</td>
</tr>
<tr>
<td>BIOL 469</td>
<td>3</td>
<td>Evolution &amp; Medicine</td>
</tr>
<tr>
<td>BIOL 470</td>
<td>4</td>
<td>Biogeography</td>
</tr>
<tr>
<td>BIOL 473</td>
<td>3</td>
<td>Limnology</td>
</tr>
<tr>
<td>BIOL 476L</td>
<td>5</td>
<td>Conservation Biology</td>
</tr>
<tr>
<td>BIOL 478</td>
<td>3</td>
<td>Topics in Sustainable Fisheries</td>
</tr>
<tr>
<td>BIOL 480L</td>
<td>4</td>
<td>Field Ecology</td>
</tr>
<tr>
<td>BIOL 481L</td>
<td>5</td>
<td>Experimental Ecology and Evolution</td>
</tr>
<tr>
<td>ESRM 350</td>
<td>5</td>
<td>Wildlife Biology and Conservation</td>
</tr>
<tr>
<td>ESRM 465</td>
<td>3</td>
<td>Economics of Conservation</td>
</tr>
<tr>
<td>FISH/ENVIR</td>
<td>330</td>
<td>Climate Change Impacts on Marine Ecosystems</td>
</tr>
<tr>
<td>FISH 444</td>
<td>5</td>
<td>Conservation Genetics</td>
</tr>
<tr>
<td>FISH 464</td>
<td>4</td>
<td>Arctic Vertebrate Ecology</td>
</tr>
</tbody>
</table>

V. NATURAL HISTORY/BIODIVERSITY:

Natural History is the study of the characteristics, life cycles, and biological background of a particular 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 and/or analyze both the organisms and their interactions in their natural habitats. *Natural history is a separate requirement from your Advanced Electives.*

Select one of the following courses: (3 credits minimum)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 280</td>
<td>4</td>
<td>The History of Life</td>
</tr>
<tr>
<td>BIOL/FISH 311L</td>
<td>3/5</td>
<td>Biology of Fishes*</td>
</tr>
<tr>
<td>BIOL 317L</td>
<td>5</td>
<td>Plant Identification and Classification</td>
</tr>
<tr>
<td>BIOL/ESRM 331</td>
<td>3</td>
<td>Landscape Plant Recognition</td>
</tr>
<tr>
<td>BIOL/FHL 430L</td>
<td>5</td>
<td>Marine Zoology <em>(FHL)</em></td>
</tr>
<tr>
<td>BIOL/FHL 432L</td>
<td>9</td>
<td>Marine Invertebrate Zoology <em>(FHL)</em></td>
</tr>
<tr>
<td>BIOL 433L</td>
<td>5</td>
<td>Marine Ecology</td>
</tr>
</tbody>
</table>
| BIOL 434L   | 5       | Invertebrate Zoology *
| BIOL 437L   | 5       | Herpetology |
| BIOL 438L   | 5       | Quantitative Approaches to Paleobi, Morph, & Systematics |
| BIOL 439L   | 5       | Functional Morphology* |
| BIOL 440L   | 5       | General Mycology |
| BIOL 441L   | 5       | Trends in Land Plant Evolution |
| 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* |
| ENVIR 280   | 5       | Natural History of the Puget Sound Region |
| ESRM 435/436 | 3/2     | Insect Ecology |
| 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 PHYSIOLOGY ELECTIVES (31 credits)

- You are required to have a minimum of 31 credits from the selection below.
- Within these 31 credits students must select at least two Advanced Physiology elective courses and one Physiology Lab course.

<table>
<thead>
<tr>
<th>Advanced Physiology Classes – select <strong>two</strong> courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 404 (3) Animal Physiology: Cellular Aspects</td>
</tr>
<tr>
<td>BIOL 417 (4) Comparative Reproductive Physiology of Vertebrates</td>
</tr>
<tr>
<td>BIOL 418 (4) Biological Clocks and Rhythms</td>
</tr>
<tr>
<td>BIOL 421L (4) Ecological and Evolutionary Physiology of Vertebrates</td>
</tr>
<tr>
<td>BIOL/ESRM 424/478L (5) Plant Eco-Physiology+</td>
</tr>
<tr>
<td>BIOL 425L (5) Adv. Plant Physiology &amp; Development+</td>
</tr>
<tr>
<td>BIOL 427L (5) Biomechanics+</td>
</tr>
<tr>
<td>BIOL 428L (5) Sensory Neurophysiology and Ecology Lab+</td>
</tr>
<tr>
<td>BIOL 439L (5) Functional Morphology++</td>
</tr>
<tr>
<td>BIOL 452L (5) Vertebrate Biology ++</td>
</tr>
<tr>
<td>BIOL 453L (5) Comparative Vertebrate Anatomy++</td>
</tr>
<tr>
<td>BIOL 457 (3) Chemical Communication</td>
</tr>
<tr>
<td>BIOL 460 (3) Mammalian Physiology</td>
</tr>
<tr>
<td>BIOL 461 (3) Neurobiology</td>
</tr>
<tr>
<td>BIOL 462 (3) Advanced Animal Physiology</td>
</tr>
<tr>
<td>BIOL 465 (3) Comparative Endocrinology</td>
</tr>
<tr>
<td>BIOL 466 (3) Pathobiology of Emerging Diseases</td>
</tr>
<tr>
<td>BIOL 467 (3) Comparative Animal Physiology</td>
</tr>
<tr>
<td>BIOL 468 (3) Medical Physiology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physiology Lab requirement – select <strong>one</strong> course:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 302L (4) Laboratory Techniques in Cell and Molecular</td>
</tr>
<tr>
<td>BIOL 310L (5) Survey of Human Anatomy</td>
</tr>
<tr>
<td>BIOL 400L (4) Experiments in Molecular Biology</td>
</tr>
<tr>
<td>BIOL 402L (4) Functional Genomics</td>
</tr>
<tr>
<td>BIOL 407L (4) Molecular Cell Biology of Neural Stem Cells</td>
</tr>
<tr>
<td>BIOL 421L (4) Ecological &amp; Evolutionary Physiology of Animals+</td>
</tr>
<tr>
<td>BIOL/ESRM 424/478L (5) Plant Eco-Physiology+</td>
</tr>
<tr>
<td>BIOL 425L (5) Adv. Plant Physiology &amp; Development+</td>
</tr>
<tr>
<td>BIOL 428L (5) Sensory Neurophysiology and Ecology Lab+</td>
</tr>
<tr>
<td>BIOL 439L (5) Functional Morphology++</td>
</tr>
<tr>
<td>BIOL 452L (5) Vertebrate Biology ++</td>
</tr>
<tr>
<td>BIOL 453L (5) Comparative Vertebrate Anatomy++</td>
</tr>
<tr>
<td>BIOL 427L (5) Biomechanics+</td>
</tr>
<tr>
<td>BIOL 463L (3) Adv. Animal Physiology Lab</td>
</tr>
<tr>
<td>BIOL 466L (4) Basic Techniques in Biochemistry</td>
</tr>
<tr>
<td>BIOL 467L (5) Aquatic Animal Physiology and Reproduction **</td>
</tr>
<tr>
<td>BIOL 499L (4) Undergraduate Research <em>(Must be Approved, see notes)</em>*</td>
</tr>
</tbody>
</table>

**Electives – may be chosen from the list below and from the Advanced Electives and Lab lists above:**

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 305 (3) Science Communication: Video Storytelling in Biology</td>
</tr>
<tr>
<td>BIOL 350 (3) Foundations in Physiology</td>
</tr>
<tr>
<td>BIOL 355 (3) Foundations in Molecular Cell Biology</td>
</tr>
<tr>
<td>BIOL 359 (3) Foundations in Quantitative Biology</td>
</tr>
<tr>
<td>BIOL 396 (1-4) Peer Facilitation in Biology</td>
</tr>
<tr>
<td>BIOL 399 (2-12) Biology Internship Program</td>
</tr>
<tr>
<td>BIOL 401 (3) Advanced Cell Biology</td>
</tr>
<tr>
<td>BIOL/PSYCH 408 (4) Neuroethology</td>
</tr>
<tr>
<td>BIOL 410 (2) Current Topics in Molecular and Cellular Biology Research</td>
</tr>
<tr>
<td>BIOL 411 (4) Developmental Biology</td>
</tr>
<tr>
<td>BIOL 416 (3) Molecular Genetics of Plant Development</td>
</tr>
<tr>
<td>BIOL 419 (4) Data Science for Biologists</td>
</tr>
<tr>
<td>BIOL 422 (3) Physiology of Plant Behavior</td>
</tr>
</tbody>
</table>

Continued on next page...
VI. PHYSIOLOGY ELECTIVES….. continued:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Title of Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 431</td>
<td>1</td>
<td>Biology of Cannabinoids Seminar</td>
</tr>
<tr>
<td>BIOL 455</td>
<td>4</td>
<td>Human Immunology &amp; Pathology of Infectious Diseases</td>
</tr>
<tr>
<td>BIOL 459</td>
<td>3</td>
<td>Developmental Neurobiology</td>
</tr>
<tr>
<td>BIOL 464</td>
<td>3</td>
<td>Molecular Mechanisms of Cancer Seminar</td>
</tr>
<tr>
<td>BIOL 475L</td>
<td>3-5</td>
<td>Intensive Field Experience in Biology</td>
</tr>
<tr>
<td>BIOL 485</td>
<td>1-3</td>
<td>Sr. Seminar in Cell, Molecular and Developmental Biology</td>
</tr>
<tr>
<td>BIOL 488</td>
<td>1-3</td>
<td>Sr. Seminar Special Topics in Physiology</td>
</tr>
<tr>
<td>BIOL 492</td>
<td>3</td>
<td>Teaching Biology Inclusively to Diverse Audiences</td>
</tr>
<tr>
<td>BIOL 494</td>
<td>5</td>
<td>Controversies in Biology</td>
</tr>
<tr>
<td>BIOL 405</td>
<td>3</td>
<td>Introduction to Biochemistry²</td>
</tr>
<tr>
<td>BIOL 406</td>
<td>3</td>
<td>Introduction to Biochemistry²</td>
</tr>
<tr>
<td>BIOL 440</td>
<td>4</td>
<td>Biochemistry²</td>
</tr>
<tr>
<td>BIOL 441</td>
<td>4</td>
<td>Biochemistry²</td>
</tr>
<tr>
<td>BIOL 442</td>
<td>4</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>FISH 324</td>
<td>3</td>
<td>Aquatic Animal Physiology and Reproduction*</td>
</tr>
<tr>
<td>FISH 441L</td>
<td>3/5</td>
<td>Integrative Environmental Physiology*</td>
</tr>
<tr>
<td>IMMUN 441</td>
<td>4</td>
<td>Intro to Immunology</td>
</tr>
<tr>
<td>MICROM 460</td>
<td>3</td>
<td>Medical Mycology and Parasitology</td>
</tr>
<tr>
<td>NUTR 405</td>
<td>3</td>
<td>Physical Activity in Health and Disease</td>
</tr>
<tr>
<td>NUTR 406</td>
<td>3</td>
<td>Sports Nutrition</td>
</tr>
</tbody>
</table>

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

Continued on next page…
IX. ADDITIONAL NOTES:

• A cumulative GPA of 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 for BIOL 180/200/220 registration purposes. 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 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 a class that can only be an elective or natural history, not both

(FHL) Indicates course taught at Friday Harbor Labs.

1 396 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).

+ Can count as both a physiology class and a lab

2 Only 1 class per pair can count as an elective from 405/440 and 406/441