Botany

Bachelor of Science degree
with a major in Botany

Minor in Botany

Master of Science degree
in Biology (see Biology)

Department Chair
Amy Sprowles, Ph.D.

Department of Biological Sciences
Science Complex B 221
707-826-3245
humboldt.edu/biosci

The Program

Students completing this program will have demonstrated the ability to:
- apply the scientific method to questions in biology by formulating testable hypotheses, gathering data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses
- present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists
- access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works
- apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations
- identify the major groups of organisms and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of organisms that differentiate the various domains and kingdoms from one another
- use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped organismal morphology, physiology, life history, and behavior
- explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life
- explicate the ecological interconnectedness of life on earth by tracing energy and nutrient flows through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems
- demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology.

Humboldt State University has the largest greenhouse of all the state campuses, containing an extensive collection of plants from around the world. Students also find a large collection of pressed plants in the herbarium.

Several plant growth chambers allow students to control growing conditions of plants. Native plants in nearby wilderness areas also provide excellent opportunity for study.

Our botany graduates do well in these careers: herbarium curator, naturalist, plant physiologist, technical writer, plant ecologist, environmental consultant, botanist, horticulturist, science librarian, plant pathologist.

Preparation

In high school take biology, chemistry, and physics (with labs, if possible), algebra (beginning, intermediate), geometry, and trigonometry.

requires for the major

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see, "The Bachelor's Degree" section of the catalog, pp. 67-82.

Unit Requirements

Total units in the major: 72-79
Total units required for the degree: 120

Special Grade Requirement

Students who receive a grade below a C- in any prerequisite course will require instructor approval for enrollment.

Lower Division (34-37 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>Principles of Biology</td>
</tr>
<tr>
<td>BOT 105</td>
<td>General Botany</td>
</tr>
<tr>
<td>CHEM 109</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>CHEM 228</td>
<td>Brief Organic Chemistry</td>
</tr>
<tr>
<td>MATH 105</td>
<td>Calculus for the Biological Sciences &amp; Natural Resources*</td>
</tr>
<tr>
<td>PHYX 106</td>
<td>College Physics: Mechanics &amp; Heat</td>
</tr>
<tr>
<td>PHYX 107</td>
<td>College Physics: Electromagnetism &amp; Modern Physics, or</td>
</tr>
</tbody>
</table>

Upper Division (38-42 units)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 307</td>
<td>Evolution</td>
</tr>
<tr>
<td>BIOL 330</td>
<td>Principles of Ecology</td>
</tr>
<tr>
<td>BIOL 340</td>
<td>Genetics</td>
</tr>
<tr>
<td>BOT 310</td>
<td>General Plant Physiology</td>
</tr>
</tbody>
</table>

Botanical Diversity

Complete three of the five (a-e) options:

a) BOT 350 (4) Plant Taxonomy
b) BOT 354 (4) Agroecology
c) BOT 355 (4) Lichens & Bryophytes
d) BOT 356 (4) Phycology
e) BOT 358 (2) Biology of the Microfungi and BOT 359 (2) Biology of Ascomycetes & Basidimycetes, or

Primary Pathology

and BOT 360 (2) Biology of the Fleshy Fungi and BOT 360L (2) Biology of the Fleshy Fungi Lab, or

BOT 394 (3) Forest Pathology

Plant Structure/Development/Evolution

Complete one course.

BOT 322 (4) Developmental Plant Anatomy
BOT 372 (4) Evolutionary Morphology of Plants
BOT 521 (3) Paleobotany

Life Science Electives

Complete one of the following or an upper division zoology (ZOOL), fisheries (FISH) or wildlife (WLDF) course with a lab for 3-5 units. The course must be approved by your academic advisor.

BOT 330 (2) Plant Ecology, and
BOT 330L (1) Plant Ecology Lab
BOT 553 (3) Marine Macrophyte Ecology
BIOL 350 (3) Cell Biology
BIOL 412 (4) General Microbiology
BIOL 418 (3) Marine Microbiology
BIOL 433 (3) Microbial Ecology, and
BIOL 433D (1) Microbial Ecology Discussion
BIOL 434 (4) Population & Community Ecology
BIOL 448 (3) Biogeography

* MATH 109 may substitute for MATH 105.
BIOL 564  (4) Transmission & Scanning Electron Microscopy
OCN 109  (3) General Oceanography and
OCN 109L (1) General Oceanography Lab
SOIL 260 (3) Introduction to Soil Science

Research Requirement
Complete one course (1 unit) from:
BIOL 490  (1-2) Senior Thesis
BIOL 499  (1-2) Directed Study

REQUIREMENTS FOR THE MINOR
Total units required for the minor:  22

Lower Division (8 units)
BIOL 105  (4) Principles of Biology
BOT 105  (4) General Botany

Upper Division Electives (14 units)
Complete 14 units of upper division courses in botany, approved by minor advisor. Of these 14 units, a minimum of 6 units must be courses NOT used to satisfy your major requirements.

Note:  BOT 300 Plants & Civilization may NOT be used to satisfy requirements for the botany minor.