

BOTANY

Bachelor of Science degree with a major in Botany

Minor in Botany

Master of Science degree in Biology (see Biology)

Department Chair

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Department of Biological Sciences

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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.

REQUIREMENTS

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

REQUIREMENTS 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. 66-81., and "The Master's Degree" pp. 82-84.

Lower Division

| | | |
|----------|-----|---|
| BIOL 105 | (4) | Principles of Biology |
| BOT 105 | (4) | General Botany |
| CHEM 109 | (5) | General Chemistry I |
| CHEM 110 | (5) | General Chemistry II |
| CHEM 228 | (4) | Brief Organic Chemistry |
| MATH 105 | (3) | Calculus for the Biological Sciences & Natural Resources* |
| PHYX 106 | (4) | College Physics: Mechanics & Heat |
| PHYX 118 | (1) | College Physics: Biological Applications |

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| STAT 109 | (4) | Introductory Biostatistics |
| ZOOL 110 | (4) | Introductory Zoology |

Upper Division

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| BIOL 307 | (4) | Evolution |
| BIOL 330 | (4) | Principles of Ecology |
| BIOL 340 | (4) | Genetics |
| BOT 310 | (4) | Gen. Plant Physiology |

Three courses in plant groups from the following four:

1. BOT 350 (4) Plant Taxonomy
2. BOT 355 (4) Lichens & Bryophytes
3. BOT 356 (4) Phycology
4. One of the following mycology options:
 - BOT 358 (2) Biology of the Microfungi, **and**
 - BOT 359 (2) Biology of Ascomycetes & Basidiomycetes, **or**
 - BOT 360 (2) Biology of the Fleshy Fungi **and**
 - BOT 360L (2) Biology of the Fleshy Fungi Lab, **or**
 - BOT 394 (3) Forest Pathology

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| BOT 322 | (4) | Developmental Plant Anatomy, or |
| BOT 372 | (4) | Evolutionary Morphology of Plants |
| BIOL 412 | (4) | General Bacteriology, or |
| BIOL 433 | (3) | Microbial Ecology and |
| BIOL 433D | (1) | Microbial Ecology Discussion, or |

one upper division zoology course with lab

One unit from:

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| BIOL 490 | (1-2) | Senior Thesis, or |
| BIOL 499 | (1-2) | Directed Study |

REQUIREMENTS FOR THE MINOR

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|----------|-----|-----------------------|
| BIOL 105 | (4) | Principles of Biology |
| BOT 105 | (4) | General Botany |

14 units of upper division courses in botany, approved by the botany minor advisor



* MATH 109 may substitute for MATH 105.