

# BOTANY

## Bachelor of Science degree with a major in Botany

### Minor in Botany

## Master of Science degree in Biology (see Biology)

### Department Chair

Bruce O'Gara, Ph.D.

### Department of Biological Sciences

Science Complex B 221

707-826-3245

www.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.

### 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. 61-77., and "The Master's Degree" section of the catalog, pp. 78-80.*

#### 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  
MATH 105 (3) Calculus for the Biological Sciences & Natural Resources  
[MATH 109 may substitute for MATH 105.]

- PHYX 106 (4) College Physics: Mechanics & Heat  
PHYX 118 (1) College Physics: Biological Applications  
STAT 109 (4) Introductory Biostatistics  
ZOO 110 (4) Introductory Zoology

#### Upper Division

- 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/BOT 360L (2/2) Biology of the Fleshy Fungi/Lab, **or**
  - BOT 394 (3) Forest Pathology

CHEM 328 (4) Brief Organic Chemistry

BOT 322/BOT 522 (4) Developmental Plant Anatomy, **or**

BOT 372/BOT 572 (4) Evolutionary Morphology of Plants

BIOL 412 (4) General Bacteriology, **or**  
BIOL 433/433D (3/1) Microbial Ecology, **or** one upper division zoology course with lab

One unit from:

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

### REQUIREMENTS FOR THE MINOR

- 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

