

## PLANT BIOLOGY DEPARTMENT

<http://www.uvm.edu/cals/plantbiology>

### CALS Plant Biology Major

The undergraduate Plant Biology program at the University of Vermont provides a broad introduction to the life sciences, from biochemistry and molecular biology to whole plant physiology and ecosystem ecology. Students receive individualized faculty attention via one-on-one advising to develop a personalized course of study. Popular study opportunities include a biennial trip to Costa Rica and an annual trip to the Galapagos. All students complete a senior capstone experience. Most students opt to conduct undergraduate research as part of a faculty-led research group, either in a plant science laboratory or at the internationally acclaimed Proctor Maple Research Center or at the Pringle Herbarium, the third largest plant collection in New England.

## MAJORS

### PLANT BIOLOGY MAJOR

Plant Biology B.S.

## MINORS

### PLANT BIOLOGY MINOR

Plant Biology

## GRADUATE

Field Naturalist M.S.

Plant Biology M.S.

Plant Biology Ph.D.

See the online Graduate Catalogue for more information

## Courses

### PBIO 1040. Intro to Botany. 0 or 4 Credits.

Structure, function, and reproduction of plants. Fundamental aspects of plant science with implications of botanical knowledge needed for applied plant sciences. Catamount Core: N2, SU.

### PBIO 1060. Plants, Food, and Culture. 3 Credits.

Evaluation of the impact of plants on the aesthetic, cultural, social, medical, and religious lives of peoples of the world. Plant Biology and Biological Science majors will not receive credit for PBIO 1060 as part of program distribution requirements. Catamount Core: N1, SU.

### PBIO 1070. Putting Down Roots in PlantBio. 1 Credit.

Designed to introduce new Plant Biology majors to the department and the discipline through a variety of in person experiences and hands-on activities featuring the range of plant biology resources and research at UVM. Helps students build connections to the plant biology community, demystify the college experience, and navigate the major. Prerequisite: Plant Biology major.

### PBIO 1890. Ecuador: Natural History. 3 Credits.

Provides a hands-on exploration of the unique biodiversity found in the tropical Andes and the Galapagos Islands, while studying ideas of how this great diversity came to be, and examining conservation efforts employed to protect it. Prerequisites: Instructor permission. Catamount Core: GC1, SU.

### PBIO 1990. Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

### PBIO 1991. Internship. 1-3 Credits.

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

### PBIO 1993. Independent Study. 1-18 Credits.

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

### PBIO 2040. Plant Physiology. 0 or 4 Credits.

Study of the plant as a whole, growth and development, water and mineral relations, environmental factors, and regulatory processes. Prerequisites: BCOR 1400 and BCOR 1450, or BIOL 1400 and BIOL 1450, or BCOR 1425; CHEM 1400 and CHEM 1450, or CHEM 1100 and CHEM 1150, or CHEM 1400 and CHEM 1150; or Instructor permission. Catamount Core: N2.

### PBIO 2080. Morph & Evo of Vascular Plants. 0 or 4 Credits.

Evolutionary relationships of vascular plants as inferred from plant structure, ecology, geography, and reproductive biology. Synthesis includes both fossil and extant groups. Prerequisites: PBIO 1040, BIOL 1450, BCOR 1450, or BCOR 1425, or Instructor permission.

### PBIO 2090. Plant Systematics. 0 or 4 Credits.

Collection and identification of ferns and flowering plants; survey of prominent Vermont plant families; plant nomenclature, classification, and phylogeny; species concepts and speciation; floral function. Prerequisites: PBIO 1040 or BIOL 1450 or BCOR 1450 or BCOR 1425 or Instructor permission.

### PBIO 2170. Plant Pathology. 0 or 4 Credits.

Introduction to the causes of agricultural and forest plant diseases including examination of the relationship of the plant, pathogen, and environment in disease development and disease management. Prerequisites: PBIO 1040, or BIOL 1400 and BIOL 1450, or BCOR 1400 and BCOR 1450, or BCOR 1425, or Instructor permission. Cross-listed with: PSS 2170.

### PBIO 2330. How Plants Can Save World. 3 Credits.

Explores how plants can be used to design sustainable solutions to problems resulting from existing, unsustainable practices in agriculture, energy, and health. Prerequisites: BIOL 1400 and BIOL 1450, or BCOR 1400 and BCOR 1450, or BCOR 1425, or PBIO 1040. Cross-listed with: ENVS 2660. Catamount Core: SU.

**PBIO 2440. Nature-Based Climate Solutions. 3 Credits.**

Explores the scale of global change while focusing on ways plants can be used to mitigate and adapt to the future climate while enhancing native plant biodiversity. Students will gain practical skills by engaging with community partners and contributing to nature-based climate solutions projects in the local Burlington community. Prerequisites: BIOL 1450, BCOR 1450, or PBIO 1040.

**PBIO 2510. Plant Anatomy. 3 Credits.**

Introduction to the structural and developmental anatomy of roots, stems, and leaves, including basic tissue types, vascular anatomy, woody plant anatomy, and reproductive anatomy. Prerequisites: BIOL 1400 or BCOR 1400 or BCOR 1425.

**PBIO 2770. Biology of Fungi. 4 Credits.**

Collect, identify and study major fungal groups, especially basidiomycetes (mushrooms, rusts and smuts), ascomycetes (cup fungi, yeasts and mildews), and affiliated taxa. Extensive field and lab work, with thematic lectures. Prerequisite: PBIO 1040 or BIOL 1450 or BCOR 1450 or BCOR 1425 or Instructor permission.

**PBIO 2890. Ecuador: Natural History. 3 Credits.**

Provides a hands-on exploration of the unique biodiversity found in the tropical Andes and the Galapagos Islands, while studying ideas of how this great diversity came to be, and examining conservation efforts employed to protect it. Prerequisites: BCOR 1400 and BCOR 1450 or BIOL 1400 and BIOL 1450; Instructor permission. Catamount Core: GC1, SU.

**PBIO 2990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**PBIO 2991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PBIO 2993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PBIO 2994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PBIO 2995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisites: Department permission.

**PBIO 3090. Biology of Ferns. 3 Credits.**

Evolutionary biology; a survey of New England ferns and discussion of their phylogenetic relationships; current research emphasizing morphological, biogeographical, genetic, and phytochemical aspects of speciation. Prerequisite: PBIO 2080 or PBIO 2090 (BCOR 2300 recommended).

**PBIO 3220. Ecological Invasions. 3 Credits.**

Focuses on reading, writing and discussing the primary scientific literature in the field of invasion biology. Invasion biology draws from many different scientific disciplines, including genetics, evolution, population, community and ecosystem ecology. Students will have the opportunity to pursue one of these areas in depth through the preparation of a research paper. Prerequisite: BCOR 2100 or NR 2030.

**PBIO 3320. Plant Systematics in Costa Rica. 2 Credits.**

Intensive field trip to Costa Rica with the goal of comparing the diversity of flowering plants and ferns in four distinct tropical American forests. Emphasis on field recognition of flowering-plant families, with an appreciation of the relationship between the Costa Rican people and their landscape. Prerequisites: PBIO 2090; Instructor permission.

**PBIO 3410. Tropical Plant Systematics. 3 Credits.**

Principles and methods of angiosperm phylogeny. Recent systematic and evolutionary research on flowering plants; survey of tropical flowering plant families. Student presentations on recent research. Prerequisite: PBIO 2090.

**PBIO 3440. Community Climate Solutions. 3 Credits.**

Intensive, service-learning, experiential opportunity for UVM students in the life sciences interested in topics related to food, environment, and sustainability. Involves a mix of learning on campus in-person in the classroom and greenhouse, working off-campus with community partnerships and projects, and asynchronous online weekly assignments. Prerequisites: PBIO 2330, PBIO 2440, or BCOR 2100.

**PBIO 3750. Global Change Ecology. 3 Credits.**

Survey of global climate change including its causes, mechanisms, and ecological and societal impacts. Prerequisite: BCOR 2100 or Instructor permission. Catamount Core: N1, SU.

**PBIO 3880. The Evolution of Development. 3 Credits.**

Highlights how the integration of key concepts from developmental biology has contributed to our understanding of the proximate causes of plant and animal diversification. Prerequisite: BCOR 2100 or equivalent, BCOR 2300 or equivalent.

**PBIO 3940. Modeling of Ecological Systems. 3 Credits.**

Covers methods used to model ecological and environmental systems with a focus on system dynamics and agent-based modeling. Explores the complexity of ecological systems, including emergent properties and feedbacks between system components. Utilizes the system dynamics software Stella and the agent-based programming language Netlogo. Prerequisite: BCOR 2100 or NR 2030 or an equivalent intermediate-level course in ecology and/or evolution.

**PBIO 3990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**PBIO 3991. Internship. 1-18 Credits.**

On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

**PBIO 3993. Independent Study. 1-18 Credits.**

A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

**PBIO 3994. Teaching Assistantship. 1-3 Credits.**

Undergraduate student service as a teaching assistant, usually in an introductory level course in the discipline, for which credit is awarded. Offered at department discretion.

**PBIO 3995. Undergraduate Research. 1-18 Credits.**

Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Prerequisite: Department permission.

**PBIO 4899. Plant Biology Capstone. 1 Credit.**

Culmination of the Plant Biology major; draws together the disciplines of plant biology presented in previous coursework and other student experiences into a single over-arching perception of plant biology and its role in the world; prepares Plant Biology majors for post-graduate success. Prerequisites: Plant Biology major; Senior standing or Junior standing if graduating in December.

**PBIO 4990. Special Topics. 1-18 Credits.**

See Schedule of Courses for specific titles.

**PBIO 4996. Honors. 1-6 Credits.**

College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.