

PLANT BIOLOGY

<https://www.uvm.edu/cals/plantbiology> (<https://www.uvm.edu/cals/plantbiology/>)

OVERVIEW

The Plant Biology Department offers a Ph.D. that provides training in basic scientific research in diverse aspects of plant biology. These include physiology, developmental genetics, molecular regulation of gene expression, cell biology, plant-microbe interactions, ecological genomics, systematics and biogeography, and ecology of plant population and community dynamics. Information on specific faculty research programs may be found on the department's web page. The department also offers the project-based Field Naturalist M.S., which is a unique field-based experience that develops the potential of tomorrow's conservation leaders by emphasizing scientific integration, oral and written communication, and environmental problem solving.

DEGREES

- Field Naturalist (Plant Biology) M.S. (<http://catalogue.uvm.edu/graduate/plantbio/fieldnaturalistms/>)
- Plant Biology M.S. (<http://catalogue.uvm.edu/graduate/plantbio/plantbiologyms/>) (Not currently accepting students)
- Plant Biology Ph.D. (<http://catalogue.uvm.edu/graduate/plantbio/plantbiologyphd/>)

FACULTY

Barrington, David Stanley; Professor, Department of Plant Biology; PHD, Harvard University

Beckage, Brian; Professor, Department of Plant Biology; PHD, Duke University

Delaney, Terrence Patrick; Associate Professor, Department of Plant Biology; PHD, University of Washington Seattle

Harris, Jeanne M.; Associate Professor, Department of Plant Biology; PHD, University of California Berkeley

Keller, Stephen Robert; Assistant Professor, Department of Plant Biology; PHD, University of Virginia

Lintilhac, Philip; Research Associate Professor, Department of Plant Biology; PHD, University of California Berkeley

Molofsky, Jane; Professor, Department of Plant Biology; PHD, Duke University

Paris, Catherine Ann; Senior Lecturer, Department of Plant Biology; PHD, University of Vermont

Preston, Jill C.; Assistant Professor, Department of Plant Biology; PHD, University of Missouri

Stratton, Donald Arthur; Senior Lecturer, Department of Plant Biology; PHD, SUNY Stony Brook

Sundue, Michael A.; Research Assistant Professor, Department of Plant Biology; PHD, CUNY Graduate Center / The New York Botanical Garden

Tierney, Mary Laurretta; Associate Professor, Department of Plant Biology; PHD, Michigan State University

van den Berg, Abby Katrien; Research Assistant Professor, Department of Plant Biology; PHD, University of Vermont

Courses

PBIO 209. 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 108 or PBIO 109 (BCOR 101 recommended).

PBIO 223. Fundamentals of Field Science. 3 Credits.

Pattern and process in natural systems. Weekly discussion of unifying questions in science. Field labs teach sampling and analysis of vegetation, soils, and animals. Prerequisite: Graduate standing or several university courses in earth sciences, life sciences, and chemistry.

PBIO 232. 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 109; Instructor permission.

PBIO 241. 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 109.

PBIO 261. Plant Growth & Development. 3 Credits.

Concepts in plant structure and development. Biophysics of plant structure and pattern-formation. Introduction to methods of plant microscopy and microtechnique. Prerequisites: PBIO 104, PBIO 108, introductory Physics, or Instructor permission.

PBIO 275. Global Change Ecology. 3 Credits.

Survey of global climate change including its causes, mechanisms, and ecological and societal impacts. Prerequisite: BCOR 102 or Instructor permission.

PBIO 281. Botany Seminar. 0 Credits.

Presentations of personal research by faculty, graduate students, and outside guest speakers. Attendance required of plant biology Graduate students and Seniors in botanical research programs. Without credit.

PBIO 282. Botany Seminar. 0 Credits.

Presentations of personal research by faculty, graduate students, and outside guest speakers. Attendance required of plant biology Graduate students and Seniors in botanical research programs. Without credit.

PBIO 288. 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 102 or equivalent, BCOR 101 or equivalent.

PBIO 294. QR:Ecological Modeling. 3 Credits.

Provides an introduction to process-based modeling of ecological systems. Explores system dynamics and agent-based approaches to modeling ecological systems and processes. Includes a focus on the system dynamics modeling software Stella and the agent-based language Netlogo. Prerequisite: BCOR 102 or Instructor permission.

PBIO 311. Field Naturalist Practicum. 0-3 Credits.

Landscape analysis; planning and designing field projects; integrated problem solving. Prerequisite: Enrollment in the Field Naturalist program. Variable hours up to three.

PBIO 333. Professional Writing Essential. 1 Credit.

Basics of good writing, essay and report writing, as published in both popular and professional journals in the environment and natural resources. Prerequisite: Graduate standing. Cross-listed with: NR 333.

PBIO 334. Professional Writing AdvTopics. 1 Credit.

Writing workshop that explores essay and report writing, as published in both popular and professional journals that examine the natural world and its resources. Prerequisite: Graduate Standing. Cross-listed with: NR 334.

PBIO 369. Field Botany for NR Profession. 3 Credits.

Identification of flowering plants and ferns; survey of prominent Vermont plant families; natural communities, ecological determinants of plant distribution, especially soils; preparation of herbarium specimens. Prerequisite: Graduate Standing; Instructor Permission.

PBIO 380. Ecological Genomics. 4 Credits.

An exploration of the merger of ecology and genomics to address the genetic basis of adaptive variation in natural populations. Emphasis on integrating quantitative approaches and hands-on analysis of large genomic and ecological data sets. Pre/Co-requisites: BCOR 101, BCOR 102, STAT 141 or STAT 211; basic knowledge of statistics, probability, genetics, and evolution required; familiarity with programming in R or bash is recommended. Cross-listed with: BIOL 380.

PBIO 390. 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 391. Master's Thesis Research. 1-10 Credits.

Credit as arranged.

PBIO 392. Master's Project Research. 0-3 Credits.

Credit as arranged.

PBIO 393. 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 394. Data Modeling for Envir Scienc. 3 Credits.

Introduction to data modeling using R statistical computing language, emphasizing likelihood, information theoretic, and Bayesian approaches to inference. Course focuses on the R language as a tool for data modeling. Class time divided between lectures that introduce statistical concepts and R language constructs and labs that stress applications. Successful participants will have some statistical background. Prerequisite: A course in introductory statistics.

PBIO 395. Graduate Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.

PBIO 396. Independent Graduate Research. 1-18 Credits.

Graduate 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.

PBIO 490. 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 491. Doctoral Dissertation Research. 1-15 Credits.

Credit as arranged.

PBIO 494. Independent Graduate Research. 1-18 Credits.

Graduate 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.

PBIO 495. Doctoral Special Topics. 1-18 Credits.

See Schedule of Courses for specific titles.