

DEPARTMENT OF PLANT AND SOIL SCIENCE

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

The Plant and Soil Science (PSS) program integrates classroom and field experiences incorporating relevant environmental, social, and economic issues into the curriculum. PSS students have access to a diverse array of hand-on, high impact learning opportunities. Many of the department's courses include field components that will make Burlington and beyond part of the classroom. From stormwater mitigation, to soil testing on local farms, to creating farm business plans, students will be challenged and working within the local food system. The Agroecology and Landscape Design major is strongly linked to UVM's highly recognized environmental program. The program is flexible, allowing students to pursue their interests in plant production, landscape design, and environmental issues related to plants, pathogens, pests, soils, and water management while preparing for career opportunities and graduate studies. Choose from either of two concentrations, Agroecology which addresses land management within agriculture, or, Landscape Design which addresses multifunctional landscapes. In both concentrations, students gain an understanding of ecological systems through hands-on coursework, research, internships and engaging with local and global communities.

Through research and teaching the department engages with key environmental issues facing the use of resources. Faculty members study food security and sovereignty, sustainable food production, ecological landscape design, climate change in agricultural food systems, improvement of food crops, ecological pest management, soil health, and more. Faculty and courses span a wide range of disciplines, offering students a highly customizable course of study. PSS faculty represent the disciplines of agroecology, agronomy, entomology, horticulture, landscape design, plant pathology, and soil science.

Faculty help students develop individualized courses of study to match their interests and career goals. For more information, email: pss@uvm.edu or call (802)656-2630.

MAJORS

PLANT AND SOIL SCIENCE MAJORS

Agroecology and Landscape Design B. S.

MINORS

PLANT AND SOIL SCIENCE MINORS

Agroecology

Food Systems

Soil Science

Sustainable Landscape Horticulture

GRADUATE

Plant and Soil Science M.S.

Plant and Soil Science Ph.D.

See the online Graduate Catalogue for more information

Courses

PSS 1100. Home & Garden Horticulture. 3 Credits.

Planning, selecting, and maintaining shrubs, trees, flowers, lawns, fruits, and vegetables around the home. Suitable for students in any major.

PSS 1150. Home & Garden Horticulture Lab. 1 Credit.

This lab provides practical, hands-on horticultural skills both in and around the home. Co-requisite: PSS 1100.

PSS 1210. Intro to Agroecology. 3 Credits.

Analyzes factors driving current agricultural production systems, the problems associated with the industrial agriculture model, and the variety of approaches and practices for producing food in an ecologically sound and socially just manner. Catamount Core: N1, SU.

PSS 1280. A Bug's Life. 3 Credits.

An introduction to the world of insects and their impact on our everyday lives, from the food we eat to solving murder crimes.

PSS 1360. Illustrating Botanicals. 3 Credits.

Training in the skills required to produce aesthetically pleasing visual representations of botanical subjects grounded in technically correct plant morphology and anatomy. Use of line, shading, and color explored in depth. Media include graphite, pen and ink, colored pencils and watercolor. Includes a final project.

PSS 1370. Living Landscapes. 3 Credits.

Explores conservation and design strategies for restoring healthy ecosystems and building healthy livable communities. Through lectures, guest speakers, case studies, book discussions, field trips, and real-world class projects, students are given hands-on opportunities to learn about living landscapes in Vermont and beyond. Catamount Core: N1, SU.

PSS 1990. Special Topics. 1-18 Credits.

Courses or seminars on topics beyond the scope of existing department offerings.

PSS 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.

PSS 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.

PSS 2060. Entomology & Pest Mgmt. 0 or 4 Credits.

Covers basic entomology, insect diversity and identification, and the basic principles of pest management. Prerequisites: BIOL 1400 and BIOL 1450, or BCOR 1400 and BCOR 1450, or BCOR 1425.

PSS 2120. Weed Ecology & Management. 0 or 3 Credits.

Identification, ecology, and management of weeds and other invasive plants in agriculture, urban/suburban landscapes, and natural areas. Prerequisites: PSS 1100 or PSS 1210, or PBIO 1040, or Instructor permission.

PSS 2170. Plant Pathology. 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: PBIO 2170.

PSS 2200. Cold Climate Viticulture. 3 Credits.

Students will learn principles and practices of commercial cold-climate grape production, including: site selection and preparation; cold hardiness development; varietal selection; vine training and trellising systems; nutrient, water and pest management; harvest and postharvest considerations, including basic winemaking principles. Prerequisites: PSS 1100 or PSS 1210 or Instructor permission.

PSS 2210. Indoor Plants. 1 Credit.

Indoor flowers, culture, related topics such as design. Prerequisite: PSS 1100 or PSS 1210, or one semester of Biology, or Instructor permission.

PSS 2230. Garden Flowers. 2 Credits.

Outdoor flowers, culture, related topics. Prerequisite: PSS 1100 or PSS 1210, or one semester of Biology, or Instructor permission.

PSS 2240. Sust Veg Crops Production. 3 Credits.

Introduces students to current practices in organic and conventional vegetable cropping systems and farm management. Prerequisite: PSS 1100 or PSS 1210 or Instructor permission.

PSS 2250. Woody Landscape Plants. 0 or 4 Credits.

Identification, climatic requirements, cultural management, and use of ornamental plant materials in landscape planting. Prerequisite: PSS 1100 or PSS 1210, or one semester of Biology, or Instructor permission.

PSS 2270. Greenhouse Operations & Mgmt. 0 or 4 Credits.

Principles and practices of commercial greenhouse management including construction, heating, cooling, container media, watering, fertilization, light and temperature, growth regulators, integrated pest management and disease control. Prerequisite: PSS 1100, PSS 1210, one semester Biology, or Instructor permission.

PSS 2280. Intro to Hemp Production. 3 Credits.

An introduction to the botany, agronomy, and end-use potential of industrial hemp; an authoritative introduction for those interested in knowing more about this renewable material that is an excellent source of food, fiber, building products, and therapeutic resins. Prerequisite: PSS 1100 or PSS 1210 or Instructor permission.

PSS 2330. Agroterrorism and Biopiracy. 3 Credits.

Examines examples of agroterrorism and biological warfare on food production systems, outbreaks of pests introduced by trade routes and migrations, history of collecting and introducing new valuable crops, and the legal framework used to regulate collections and protect societies from the introduction of new pests. Prerequisite: PSS 1100, PSS 1210, MMG 1020, ASCI 1070, CDAE 1320, BIOL 1400, or BCOR 1400.

PSS 2370. Landscape Design Fundamentals. 3 Credits.

Lecture course that introduces students to the history and principles of landscape design. Examines various aspects of built environments with consideration of natural and cultural phenomena, with topics to include: spatial scale, equity, land use, design precedent, soils, plants, water, recreation, transportation, and more. Prerequisites: PSS 1370, PSS 1100, PSS 1210, ENVS 1010, ENVS 1020, NR 1010, NR 1020, or CDAE 1010; minimum Sophomore standing; or instructor permission.

PSS 2371. Landscape Design Studio. 3 Credits.

Studio course that introduces students to the practice and profession of landscape design. Through a series of studio exercises, field trips, and a real-world final design project, explores the landscape design process from site inventories and analyses to conceptual plans and schematic planning, as well as other supporting design deliverables. Prerequisites: PSS 2370, PSS 2560, ARTS 1010, or CDAE 1160; minimum Sophomore standing; or instructor permission. Pre/Co-requisite: PSS 2370.

PSS 2380. Commercial Plant Propagation. 0 or 4 Credits.

Principles and practices involved in propagating herbaceous and woody plants by seeds, division, layering, cuttings, budding, grafting, and aseptic culture. Prerequisite: PSS 1100, PSS 1210, one semester Biology, or Instructor permission.

PSS 2430. Forage and Pasture Mgmt. 4 Credits.

Forage crops and grasslands play a central role in sustainable and diversified agriculture. Covers the scientific principles and practical applications of the production, management, and utilization of perennial and annual forage crops used by livestock and equine. Pre/co-requisites: BIOL 1400 or BIOL 1450 or BCOR 1400 or BCOR 1450 or PBIO 1040 or PBIO 1060 or Instructor permission. Cross-listed with: ASCI 2240.

PSS 2450. Turfgrass Management. 3 Credits.

Establishment, maintenance, and utilization of turf for aesthetic, athletic and utility functions. Pre/co-requisite: PSS 1100, PSS 1210, one semester of Biology, or Instructor permission.

PSS 2540. Composting Ecology & Mgmt. 3 Credits.

Examines ecological, physical and chemical principles, the practical management of the composting process, and benefits of using compost in plant and soil ecosystems. Prerequisite: Three credits in basic biological or ecological science or Instructor permission.

PSS 2560. Permaculture. 0 or 3 Credits.

Design of agriculturally productive environments that have the diversity, stability, and resilience of the natural biosphere to harmoniously integrate landscape and people. Prerequisite: PSS 1100 or PSS 1210 or BIOL 1450 or NR 2030 or BCOR 1450 or BCOR 2100 or other basic ecology course or Instructor permission.

PSS 2610. Fundmntls of Soil Science. 0 or 4 Credits.

Biological, chemical, and physical properties of the dynamic soil system as related to plant growth and environmental problems. Prerequisite: Inorganic chemistry or permission. Catamount Core: SU.

PSS 2620. Soil Fertility & Conservation. 3 Credits.

An ecological approach to soil management including nutrient supply and uptake, rhizosphere-microbial interactions, soil conservation, and nutrient management strategies. Prerequisite: PSS 2610 or Instructor permission.

PSS 2720. Crop Breeding. 0 or 4 Credits.

Service learning course; acquaints students with the primary objectives and tools of plant breeding theory, practice, and history through engagement in breeding activities with community partners. Builds understand of how crops are improved to meet farmer demands. Prerequisite: PSS 1210 or PSS 1100 or PBIO 1060 or BIOL 1400 or BCOR 1400.

PSS 2810. Prof Dev:Eco Ag/Sust Lndsc Hrt. 1 Credit.

Students will develop and articulate a professional philosophy and improve skills in career development including writing, resume preparation, effective interviewing and negotiation. Prerequisites: Ecological Agriculture, Sustainable Landscape Horticulture, or Agroecology & Landscape Design Major; minimum Sophomore standing; or Instructor permission.

PSS 2990. Special Topics. 1-18 Credits.

Courses or seminars on topics beyond the scope of existing department offerings. Prerequisite: Instructor permission.

PSS 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.

PSS 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.

PSS 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.

PSS 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. Prerequisite: Permission. More than a total of six credits per semester requires the permission of the Department Chair.

PSS 3080. Diversified Farm Planning. 3 Credits.

Students study diverse farming systems to gain financial, management, and technical knowledge to plan a new or evaluate and existing farm enterprise. Prerequisites: PSS 1210 and one 2000-level PSS course, equivalent experience, or Instructor permission.

PSS 3090. Diversified Farm Operations. 6 Credits.

An experiential course in sustainable, diversified vegetable production that includes soil fertility, weed, insect and disease control, crop planning and farm management skills. Prerequisites: PSS 1210 and one 2000-level PSS course, equivalent experience, or Instructor permission.

PSS 3120. Advanced Agroecology. 0 or 4 Credits.

An in-depth overview of research and applications in the field of agroecology, including current ecological and social dynamics in agricultural landscapes in Vermont and abroad. Prerequisites: PSS 1210 or one semester ecology at the 2000-level or above or Instructor permission. Catamount Core: SU.

PSS 3180. Agricultural Policy and Ethics. 3 Credits.

An examination of American agriculture and policies from various perspectives - historical, political, ecological, technological, social, economic, and ethical. Emphasis on contemporary issues, policy options, and future development. Prerequisites: CDAE 2020 or PSS 3120 or equivalent. Cross-listed with: CDAE 3080.

PSS 3210. Sustainable Orchard Management. 3 Credits.

Principles and practices of commercial tree fruit production, including site considerations; cultivars; training; nutrient, water and pest management; harvest and postharvest considerations. Special emphasis on environmental and economic sustainability of the orchard system. Pre/Co-requisites: PSS 1100 or PSS 1210 or BIOL 1400 or BIOL 1450 or BCOR 1400 or BCOR 1450; and PSS 2610.

PSS 3250. Eco Frontiers in Agroecology. 3 Credits.

Examines recent peer-reviewed research that has the potential to transform the productivity or sustainability of agroecosystems. Students will be guided in developing, communicating, and justifying new questions that may potentially transform agroecology. Prerequisites: BIOL 1400, BIOL 1450 or BCOR 1400, BCOR 1450; and NR 2030 or BCOR 2100 or PSS 2060 or equivalent; or Instructor permission. Catamount Core: QD, WIL2.

PSS 3320. Biological Control. 3 Credits.

Describes theory and application of biological control of insects, disease, and weeds. Discuss ecological factors that contribute to the success of classical, augmentative, and conservation approaches to biological control. Approved for Graduate credit. Prerequisite: Course in entomology, ecology, or relevant experience. Catamount Core: QD, WIL2.

PSS 3380. Ecological Landscape Design. 4 Credits.

Studio course synthesizing work from fields of landscape ecology and landscape design, exploring ecological design alternatives at multiple scales, and developing multifunctional landscape solutions. Prerequisites: Junior standing; PSS 2370 or one course in ecology plus one course in design or drawing.

PSS 3610. Soil Morph Class & Land Use. 0 or 3 Credits.

Field techniques that describe soil properties, formation, and classification. The principles and processes of soil genesis, land use classification systems, and land use challenges. Prerequisite: PSS 2610 or Instructor permission.

PSS 3640. Chemistry of Soil & Water. 0 or 4 Credits.

An environmentally oriented study of the colloidal chemistry of soil and its interfaces with roots, water, and air. Prerequisites: PSS 2610, two semesters Chemistry or Instructor permission.

PSS 3680. Soil Ecology. 0 or 4 Credits.

Underlying concepts and theory of modern soil ecology will be reviewed including spatial and temporal distributions, sampling methods, biogeochemical cycles, and ecological functions of soil. Prerequisites: BCOR 2100 or NR 2030, and PSS 2610. Cross-listed with: NR 4680.

PSS 3690. Soil/Water Pollution/Bioremed. 3 Credits.

Examines key issues in pollution of soil and water. Topics include type of pollutants, their reactions in soil and water, pollution prevention and bioremediation. Prerequisites: PSS 2610 or Instructor permission.

PSS 3990. Special Topics. 1-18 Credits.

Lectures, laboratories, readings, field projects, surveys, or research designed to provide specialized experience in horticulture, agronomy, soils, entomology, and integrated pest management. Prerequisite: Instructor permission.

PSS 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.

PSS 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.

PSS 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.

PSS 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: Instructor permission. More than a total of six credits per semester requires Chair permission.

PSS 4990. Special Topics. 1-18 Credits.

Courses or seminars on topics beyond the scope of existing department offerings.