

# DEPARTMENT OF ENVIRONMENTAL SCIENCES

## Environmental Science, Bachelor of Science

### Jake Brenner, *Professor and Chairperson*

Known around the Ithaca College campus as simply “ENVS,” the Department of the Environment takes a transdisciplinary approach to the study of human-environment relations. The Bachelor of Science major program in Environmental Science is rooted in cutting-edge research, theory, and practice. Subject matter, methods, and approaches represent a diverse array of current environmental fields. The minor in Environmental and Society is for students majoring in other academic disciplines who wish to build fundamental literacy in environmental studies or apply their disciplinary knowledge and skills to current environmental issues.

ENVS is an ambitious, innovative department in which faculty and students interact closely in the classroom, laboratory, and field. One of the great strengths of the curriculum and its faculty is a focus on hands-on, experiential, or active teaching and learning. Our “living classrooms” include several indoor and outdoor gardens, a 560-acre conservation reserve system, a working sugarbush, a greenhouse, and state-of-the-science lab facilities. Our department takes full advantage of the nationally recognized environmental policy incubator of Ithaca, New York and the ecologically and culturally unique Finger Lakes Region. Many students engage with the local community and broader region through internships and other service-learning experiences.

Students also have the opportunity to work with faculty and design their own projects in a range of study areas. Topics include regenerative agriculture, watershed pollution, tree-ring dating, wildlife tracking, forest carbon dynamics, regional environmental history, aquaponics, archaeology, and non-timber forest and hemp production. In all these projects, and more, students lead the way.

## Majors & Minors

- Environmental Science Major – B.S. (<https://catalog.ithaca.edu/undergrad/schools/school-humanities-sciences/department-environmental-studies-sciences/environmental-science-major-bs/>)
- Environment and Society Minor (<https://catalog.ithaca.edu/undergrad/schools/school-humanities-sciences/department-environmental-studies-sciences/environmental-studies-minor/>)

### ENVS 10400 Intro Gardening & Permaculture (NLA)

Hands-on course examining the intersection of gardening with social, economic, and biological systems. Readings combined with experiential projects including field trips, with a focus on building foundational skills through work in the IC student garden. (F, IRR)

Attributes: ESTS

1 Credit

### ENVS 11000 The Environmental Crisis: Causes and Solutions (LA)

Course provides basic literacy to understand the current environmental crisis, covering such topics as energy, population growth, climate change, biodiversity loss, resource exploitation, food production, and toxics.

Course also investigates potential solutions to minimize impact on the personal, regional, national, and international scales. (S,Y)

Attributes: ABSS, LMEL, LMSP, LSCO, SC, SO, TPJ, TQSF, TWOS

3 Credits

### ENVS 11200 Sustainability Principles and Practice (LA)

This course is designed to introduce students to the history and principles of sustainability as a new approach to addressing complex societal and environmental issues. The class will use a broad definition of sustainability, considering ecological, social, economic, political issues, and community and individual health. These components will be examined using a systems perspective that stresses their interrelatedness. (F,S,Y)

Attributes: ABSS, AN3, LMEL, LMSP, LSCO, SC, SO, TPJ, TQSF

3 Credits

### ENVS 11900 Introduction to Environmental Humanities (LA)

Introduction to the ways that humanistic disciplines (literature, religion, philosophy, history, art history) contribute to an understanding of human-environment relationships. Explores how human values toward the natural world are developed and expressed; the importance of language and storytelling in guiding human attitudes and behavior toward the environment; and the ways that the humanities can inform the theory and practice of the sciences and social sciences. (F,S)

Attributes: ABSS, AN2, AN3, HM, TQSF

4 Credits

### ENVS 12000 Environmental Sentinels (LA)

Field-based course that focuses on natural history, biodiversity, and development of the ability to perceive subtle changes in the environment. Primitive technology skills (friction fires, natural rope, medicinal plants, tracking, etc.) and field identification will be emphasized. Blending these skills and the approaches of deep wilderness awareness, students develop an ability to read land-use history and an appreciation for modern ecological science and natural resource management. Intended for environmental science and studies majors. (F,Y).

Attributes: ABSS

4 Credits

### ENVS 12100 Introduction to Environmental Science and Technology (LA)

This course will focus on the scientific principles and technological advanced fundamental to understanding human impact on the environment. We will investigate how technology contributes to as well as reduces our impact on the environment. Topics include global climate change, water quality and availability, air quality, sustainable food production, biodiversity loss, and chemical and biological waste remediation. We will tie together the political, social, and economic aspects of environmental studies using a global perspective. (S,Y)

Attributes: ABSS

4 Credits

### ENVS 14200 Wildlife Tracking and Nature Observation (LA)

This field-based course focuses on development of skills of nature observation and animal tracking in the context of modern ecology. Hands-on experience provides students the opportunity to practice tracking skills and become familiar with the details of the lives of local wildlife including coyote, deer, foxes, raccoons, opossums, weasels, mice, and bobcats. Topics and skills covered include local natural history, wildlife habitat assessment, clear print track identification, wildlife conservation, and the role of humans in today's ecosystems. (Y,U)

Attributes: ESTS, SC, TIII, TMBS

3 Credits

### ENVS 17500 Introductory Environmental Seminar (LA)

Seminar course exposes students in the environmental studies or science program to environmentally relevant research, examples of careers in the environmental field, and opportunities to meet local and regional professionals. Pass/fail only. (F,Y)

Attributes: NS

1 Credit

**ENVS 20100 Environmental Research: Introductory (LA)**

An introductory course for students who desire hands-on research in environmental studies projects but who have limited experience with research. Research will typically involve participation in continuing projects, though new, student-proposed projects may be possible if the instructor approves. Students will work closely with a faculty member to guide their study. May be repeated twice for a maximum of Prerequisites: Sophomore standing and permission of instructor. (F-S)

Attributes: ENRE, UND

1-3 Credits

**ENVS 20200 Topics in Sustainability (LA)**

An umbrella course with a different focus each semester. The course is integrative and allows students to experience sustainability firsthand through field experiences and service projects at Ecovillage and the local community, linked to the study of core principles and strategies in different areas of community sustainability. The courses taught within this umbrella include sustainable land use, teaching sustainability, fostering sustainable communities, sustainable energy systems, urban sustainability, and the sustainability movement. May be repeated for a maximum of twelve credits. Prerequisites: Sophomore standing. (F-S)

Attributes: LMSP, NS, SS

3-4 Credits

**ENVS 20400 Rainforests, Reefs, and Ruins: Belize Case Study (LA)**

Focus on the environment and culture in Belize as a case study to explore topics including: structure and function of tropical ecosystems and Mayan civilization, factors leading to high biodiversity in the tropics, importance of biodiversity to human civilization, and threats to these ecosystems. Intended to prepare students for ENVS 20500. Prerequisites: Sophomore standing and permission of instructor. (F,Y)

Attributes: ENIN, ENSS, ENVE, ESSS, LAEL, NS, SC, SO, SS, TIDE, TQSF

3 Credits

**ENVS 20500 Belize Immersion (LA)**

Two-week cultural immersion course in Belize. Activities include deep jungle overnight trips, home stays with Belizean families, and service learning. Students are responsible for additional course fees for study abroad component. Course may be used to fulfill ENVS cultural immersion requirement. Prerequisites: ENVS 20400; sophomore standing; permission of instructor. (Y)

Attributes: ENIN, LAEL, LMSP

1 Credit

**ENVS 21200 Conservation Biology (LA)**

Introduction to principles of conservation biology issues used to understand and reverse the current worldwide species loss. Examination of case studies of local and global conservation efforts to combat this species loss. Lab exercises include field trips. Lecture: Three hours. Laboratory: Three hours. This course is cross-listed with BIOL 21200; students cannot receive credit for this course and BIOL 21200.

Prerequisites: Any 10000-level ENVS or BIOL course. (IRR)

Attributes: AN2, BIEL, ENIN, ENRE, ENVE

4 Credits

**ENVS 22000 Human-Environment Geography (LA)**

This course addresses complex interactions between nature and society from a geographic perspective. The course focuses on theories and methods central to human-environment geography and applies them to the world's most important environmental issues, such as climate change, deforestation, sustainable agriculture, cities, land and water conservation, and globalization. Coursework includes literature review, project design, concept diagramming, cartography (mapping), and quantitative data analysis to address geographic questions of central relevance to sustainability. (S,Y)

Attributes: ABSS, AN1, AN3, ENVE

3 Credits

**ENVS 23000 Earth System Science (LA)**

Lab-based course that takes a whole-systems approach to understanding the physical, chemical, biological, and human interactions that determine the past, current, and future states of the earth. Students will describe key components, interactions, and concepts that characterize the earth system. The course emphasizes the generation and analysis of quantitative data. Prerequisite: ENVS 12100. (F,Y)

Attributes: ABSS, ENIN

4 Credits

**ENVS 23500 The Nature of Nature (LA)**

Investigates why different religious traditions view our planet so differently. To what extent do these traditions shape peoples' perceptions of and interactions with the natural environment? Also explores how religious communities around the globe are responding to deforestation, biodiversity loss, and climate change. Makes use of a wide range of materials, including religious texts, documentaries, ethnographic studies, and science fiction. Prerequisites: One three-credit course in the liberal arts. (E)

Attributes: ABSS, ENHU, ENVE, ESHU, HM, TMBS, TQSF

3 Credits

**ENVS 24000 Environmental Archaeology: Human Impact in the Past and Present (LA)**

This course examines the interrelationship between humans and their environments from a long-term archaeological perspective. This course emphasizes archaeological, geological, and botanical methods and analytical techniques used for long-term environmental reconstruction. Cross-listed as ANTH 24000. Students may not earn credit for ANTH 24000. Prerequisite: ANTH 10400 or ANTH 10700. This course satisfies the archaeology requirement. (S,Y)

Attributes: ABSS, AN1, ENIN, ENSS, ENVE, ESSS, SS

3 Credits

**ENVS 24300 Sustainable Energy: Powering the World (LA)**

Survey of energy. Topics include solar, wind, geothermal, electricity, fossil fuels, heat transfer, and the economic and environmental opportunities created by energy efficiency and sustainable energy systems. The course culminates with a final Energy Design Project. Cross-listed as PHYS 24300. Students may not earn credit for both PHYS 24300 and PHYS 24300. Prerequisite: Math placement score 2 or higher, math placement assessment score of 54 or greater, or completion of MATH 10400, MATH 10800, or MATH 11000 (with a C- or better). (S,Y)

Attributes: ABSS, QL, SC, TQSF

4 Credits

**ENVS 25000 Principles of Geology (LA)**

Investigation of the solid earth, plate tectonics, basic mineralogy and processes that shape the terrestrial surface. Includes laboratory and hands-on activities. Prerequisites: one ENVS, BIOL, PHYS, or CHEM course. (F,O)

Attributes: ENRE, ENVE

4 Credits

**ENVS 25200 Environmental Ethics (LA)**

A critical examination of various moral problems raised when considering environmental issues. Questions regarding the moral status of animals, and the environment as a whole are explored. Also taken up are ethical issues raised by global climate change, such as our obligations to future generations, and how to resolve tensions between economic growth and environmental protection. These issues and others generate challenging and fundamental questions of moral philosophy: What is the basis of obligation? Do animals have rights? What does it mean to say something is intrinsically valuable? ENVS 25200 and PHIL 25200 are cross-listed courses; students cannot receive credit for both. Prerequisites: One liberal arts course. (Y)

Attributes: ABSS, AN2, AN3, HM, LMEL, LSCO, TPJ, TQSF

4 Credits

**ENVS 26200 The History of Commodities in the Americas (LA)**

Examines the relationship of commodities to the larger fabric of Atlantic world history since the 15th century, exploring how the material world shapes social, political, and economic behaviors and attitudes. Considers how historians, scientists, economists, and other social scientists, have interpreted the social, political, environmental, and economic significance of particular commodities. Central to the course is a focus on how commodities have shaped the relationship between Latin America, the Caribbean, and the United States. This course addresses material goods (sugar, cod, fertilizer, etc.) as commodities, as well as the history of human trafficking, from the Trans-Atlantic Slave Trade to modern day slavery. Cross-listed with HIST 26200; students cannot take both ENVS 26200 and HIST 26200 for credit. Prerequisites: Sophomore standing or above. (Y)

Attributes: ABSS, ENHU, ENVE, ESHI, ESHU, HM, TQSF

3 Credits

**ENVS 27000 History of American Environmental Thought (LA)**

A pervasive theme in the occupancy of North America is the changing and often conflicting perception of the environment. This course focuses on the history of environmental ideas, values, behaviors, and attitudes. Topics include capitalist, Romantic, and ecological thinking; the goals of conservation and preservation; recent rethinking of primitive experience and the idea of wilderness; and today's dialogue between mainstream environmentalism and deep ecology, the latter including ecofeminism, sustainable development, and biodiversity. Students examine the profound impact each of the paradigms has had on human-environment relations in America. This course counts toward the U.S. history requirement for history department majors. Students cannot receive credit for both HIST 27000 and ENVS 27000. (Y)

Attributes: ABSS, ENHU, ENVE, ESHI, ESHU, HI2, HM, LMEL, LSCO, SL, TQSF

4 Credits

**ENVS 27100 Global Environmental History (LA)**

An introduction to the field of global environmental history that explores nature's role in world history and the ways human systems of energy, agriculture, resource extraction, trade, and transportation have affected the environment over time and vice versa. Primarily focuses on the historical impacts of environmental change around the world since the start of the industrial revolution (c. 1750). Students cannot take both HIST 27100 and ENVS 27100 for credit. (IRR)

Attributes: ABSS, ENHU, ENVE, ESHI, ESHU, HI3, LMEL, LSCO

4 Credits

**ENVS 27500 Intermediate Environmental Seminar (NLA)**

Designed to help students make conscious choices to direct their academic activities at Ithaca College and to begin to consider post-graduation goals. Prerequisites: ENVS 17500. (S,Y)

1 Credit

**ENVS 28100 Environmental Economics (LA)**

Introduction to the study of environmental problems with the perspective, analytical ideas, and methodology of economics. Emphasis is placed on the economic analysis of climate change. Topics include the relationship between economic activity and climate change, economic analysis of climate change mitigation and adaptation strategies, and economic analysis of environmental policy in both the United States and the international community. Cross-listed as ECON 28100. Prerequisites: ECON 12000. (IRR)

Attributes: ENSS, ENVE, ESSS, SS

4 Credits

**ENVS 29200 Critical Skills in Environmental Research and Practice (LA)**

Introduces critical thinking, quantitative analysis, and presentation skills necessary for effective environmental research and professional practice including problem framing, literature review, critical thinking, experimental design, and methods of scientific inquiry. Quantitative literacy concepts such as estimation, measurement, and probability are covered. How to manage large data sets, make graphs, and execute statistical tests are addressed. Focus is on data analysis leading to objective decision making and policy formulation. Issues such as resource use, environmental impact, demographics, disease, pollution, biodiversity, and climate change are examined. Highly recommended for students interested in scientific research. Prerequisites: ENVS 12100. (S,Y)

Attributes: ENRE, QL

4 Credits

**ENVS 30100 Environmental Research: Intermediate (LA)**

For intermediate students who desire hands-on research in issues relating to sustainability and the environment. Research can involve participation in continuing faculty research projects or in new, student-proposed projects. Students will work closely with a faculty member to guide their study. May be repeated for a total of (F,S,Y)

1-3 Credits

**ENVS 33100 Topics in Geography and Planning (LA)**

Intermediate course with a different focus each semester. Topics include demographics, city and regional planning, land use, and topography. May be repeated for maximum of eight credits. Lecture/discussion, may include a three-hour laboratory. Prerequisite: ENVS 22000. (IRR)

Attributes: ENIN, ENSS, ENVE, ESPE, SS

3-4 Credits

**ENVS 33300 International Environmental Policy (LA)**

This course examines an environmental issue in depth (climate change, air pollution, fisheries, endangered species, human population, water management) and the international policy negotiations around that issue. Students will attend international environmental negotiation sessions; additional course fees apply for travel. Prerequisites: Junior standing; permission of instructor. (IRR)

Attributes: GERM, UND  
3 Credits

**ENVS 34000 Topics in Pollution (LA)**

Intermediate course with a different focus each semester. Topics may include environmental toxicology, environmental health and medicine, aquatic pollution, pollution remediation, hazardous waste, or pollution policy. May be repeated for maximum of six credits when topics vary.

Prerequisites: ENVS 12100. (F,Y)

Attributes: ENIN, ENRE, ENVE, ESTS, NS, WI  
3 Credits

**ENVS 34100 Topics in Pollution: Laboratory (LA)**

Designed to complement ENVS 34000. Focuses on field and lab methods used in toxicology. Repeatable two times for a total of when topics vary. (F,Y)

Attributes: ENIN, ENRE  
1 Credit

**ENVS 35000-35002 Topics in Natural Resources and Ecology (LA)**

Intermediate course with a different focus each semester. Topics include ecological issues associated with practical conservation or management practices, such as ecosystem ecology, conservation biology, or biology of invasive species. This course may be repeated for credit when topics vary, for a maximum of eight credits. Prerequisites: Three courses in environmental studies or biology. Lecture/discussion, may include a three-hour laboratory. (IRR)

Attributes: ENIN, ENVE, ESTS, NS  
3-4 Credits

**ENVS 35100 Farming the Forest: Non-Timber Forest Products (LA)**

Highly hands-on interdisciplinary course in which students use place-based learning to understand and experience the role of forests in providing a range of provisioning services (food, fiber, medicine, fuel, and other materials) in the global social-ecological system. Integrated treatment of forest ecology, non-timber forest products management, and human-dimensions ecology leads to sustainably producing a range of non-timber forest products for a small student-run business. Students are responsible for all aspects of the business: production, safety, product research and development, sales, public education and outreach. Products include honey and other hive products, maple syrup, mushrooms, hand-carved items, herbal salves and teas, bark baskets, etc. (S,Y)

Attributes: ENIN, ESTS  
4 Credits

**ENVS 36000 Topics in Environmental Humanities (LA)**

Intermediate course with a different focus each semester. Topics include literature, philosophy, art, mythology, history, landscape design, and architecture from around the world. By exploring the myriad ways human beings have viewed nature, students will gain a better grasp of why human-environment interactions are in crisis and what it means to be human in such a world. Prerequisites: WRTG 10600, ICSM 10800, or ICSM 11800; and one of the following: ENVS 11900, ENVS 26200, ENVS 27000, or ENVS 27100. (IRR)

Attributes: ENHU, ENIN, ENVE, ESHU, HU, WI  
3 Credits

**ENVS 36600 Environmental Politics (LA)**

Examines environmental protection (and destruction) from numerous political perspectives and in relation to various political ideologies. Looks at policy-making aspects of environmental protection. Traces the development of national and international environmental movements. Considers environmental issues in terms of race, gender, and class politics. Cross-listed with POLT 36600; students cannot receive credit for POLT 36600. (Y)

Attributes: ABSS, ENSS, ENVE, ESPE, LMEL, LSCO  
4 Credits

**ENVS 38000-38002 Selected Topics in Field Studies (LA)**

Field study courses provide a multiday field trip to an off-campus ecosystem. Each field study course emphasizes a unique regional topic, and students become familiar with the major geological and ecological events as well as the human impact on sustainability of the natural ecosystem(s). Students also learn to identify the predominant flora and fauna of the area. Student projects are expected to show considerable independent effort, background information, analyses, and original synthesis. May be repeated for credit for field studies in different regions for a maximum three times or twelve credits. Prerequisites: 3 courses in ENVS or BIOL. (IRR)

Attributes: ENIN, ENSS, ENVE, ESSS, NS  
1-4 Credits

**ENVS 40200-40201 Environmental Research: Advanced (LA)**

For advanced students who desire hands-on research in issues relating to sustainability and the environment. Research can involve participation in continuing faculty research projects or in new, student-proposed projects. Students will work closely with a faculty member to guide their study. Prerequisites: ENVS 30100 and permission of instructor. May be repeated for a total of eight credits. (F,S,Y)

Attributes: ENRE  
1-4 Credits

**ENVS 47500 Advanced Environmental Seminar (NLA)**

Discussion group for seniors in environmental studies and environmental science. Course focuses on networking, and summative reflection on educational and personal growth through the preparation of an integration project and an e-portfolio. Restricted to Environmental Science and Environmental Studies majors. Prerequisites: ENVS 27500; senior standing. (S,Y)

Attributes: CP  
1 Credit

**ENVS 49000 Independent Study: Environmental Studies (LA)**

A reading program of materials of special interest to the student, undertaken under faculty direction. Prerequisites: Permission of instructor. (F-S,Y)

Attributes: UND  
1-4 Credits

**ENVS 49500 Internship: Environmental Studies (NLA)**

Permits students to explore environmental studies through a variety of work experiences. Students are expected to submit, as part of their course obligations, a thorough written evaluative report based on their experiences. Internships may be taken at national, state, and local levels, and in London under the auspices of the Ithaca College London Center. Prerequisites: Permission of instructor; completion of three-quarters of an environmental studies major or minor. 1-(F-S,Y)

1-12 Credits