

# ENVIRONMENTAL STUDIES

## Overview and Contact Information

The study of environmental problems is inherently interdisciplinary. One cannot understand their origin, impact, or potential solutions without analyzing the behavior of natural systems, as well as their interaction with economic, political, and cultural factors. The environmental studies major provides students with an appreciation of the interdisciplinary nature of environmental issues and includes courses from the humanities, natural sciences, and social sciences. The program is concerned with the interactions between people and their environment, the effects the environment has on people, and the impact of human activities on the environment.

## Contact Information

**Timothy Farnham, Chair**

**Laurie Kamins, Academic Department Coordinator**

302 Clapp Laboratory

413-538-2898

<https://www.mtholyoke.edu/acad/environmental>

## Faculty

**This area of study is administered by faculty members from related departments that participate in the Environmental Studies curriculum:**

Douglas Amy, Professor of Politics, On Leave Fall 2017, Retiring Spring 2018

Steven Dunn, Professor of Geology, Teaching Fall Only

Martha Hoopes, Professor of Biological Sciences, Teaching Fall Only

Girma Kebede, Professor of Geography

Thomas Millette, Professor of Geography; Director of the Geo-Processing Lab

Stan Rachootin, David and Lucy Stewart Professor of Biological Sciences

Lauret Savoy, David B. Truman Professor of Environmental Studies, On Leave 2017-2018

Alan Werner, Professor of Geology

Alexi Arango, Associate Professor of Physics, On Leave 2017-2018

Catherine Corson, Miller Worley Associate Professor of Environmental Studies; Leslie and Sarah Miller Director of the Center for the Environment

Timothy Farnham, Associate Professor of Environmental Studies

Michelle Markley, Associate Professor of Geology

Kate Ballantine, Assistant Professor of Environmental Studies

Christine DeLucia, Assistant Professor of History

Kevin Surprise, Visiting Lecturer in Environmental Studies

## Requirements for the Major

A minimum of 56 credits:

ENVST-100	Introduction to Environmental Studies	4
<b>Science course with Laboratory: All majors must take a 100-level science course with lab which positions them for the 200-level natural science core courses they will take.</b>		4
<b>The Core: five Courses at the 200 Level, from the approved ENVST course lists. These must all be, if not ENVST courses, from different disciplines. Of these:</b>		
One course must be either:		4
ENVST-200	Environmental Science	
BIOL-223	Ecology	
GEOL-203	Surface Processes	
The second course must be another course, in a different department, from the approved Group A (natural science) list.		4
The third course must be either:		4
ECON-219	Environmental Economics	
ENVST-210	Political Ecology	
ENVST-241	Environmental Issues	
The fourth course must be a Humanities course from the approved Group B (humanities and social sciences) course list.		4
The fifth course must also be from the Group B course list, but may be either Humanities or Social Science, as long as it's from a different department.		4
<b>Area of Concentration:</b> <sup>1</sup>		
Seven courses (28 credits) at the 200 and 300 level in an area of concentration chosen by the student. <sup>1,2</sup>		20-28
A maximum of two of these courses may also be used to fulfill Core (Group A/Group B) 200-level requirements. <sup>3</sup>		
All majors must complete at least three (and sometimes four) 300-level courses within their area of concentration. (The number of 300-level courses depends on the concentration's requirements, which must be met in full.) <sup>4,5</sup>		
<b>Statistics: All majors must take an additional course in statistics. Choose from:</b> <sup>6</sup>		4
ECON-220	Introduction to Econometrics	
STAT-140	Introduction to the Ideas and Applications of Statistics	
STAT-240	Elementary Data Analysis and Experimental Design	
STAT-241	Methods in Data Science	
STAT-242	Intermediate Statistics	
BIOL-234	Biostatistics	
<b>Senior Seminar: All majors must complete ENVST-390</b>		4
Total Credits		56-64

<sup>1</sup> Students must choose their concentration by advising period of the second semester of their sophomore year

<sup>2</sup> Lists of the specific courses required for each concentration are available from the environmental studies department office or website, or from any member of the environmental studies faculty. Other courses may be substituted if approved by the student's environmental studies advisor.

<sup>3</sup> Where appropriate and subject to advisor approval

<sup>4</sup> Independent study may be substituted for one of the required 300-level courses, with approval of advisor. Independent study cannot be substituted for ENVST-390.

<sup>5</sup> Note that many advanced courses have additional prerequisites that may not count toward core course credit for an environmental studies major.

<sup>6</sup> Individual concentrations may have additional statistics requirements.

## Additional Specifications

- Upon completing the major, students should have a solid working knowledge of those areas in the humanities, social sciences, and natural sciences that are related broadly to contemporary environmental issues. The prerequisites and intermediate courses provide necessary breadth and foundation. The advanced courses afford the opportunity to concentrate on a detailed exploration of a particular environmental topic.
- Environmental studies majors must choose an area of concentration around which to organize their advanced course work. The recommended concentrations (and advisors) are:
  - Conservation (Hoopes, Ballantine): The Conservation concentration allows students to focus on the science and policy behind conserving biodiversity and ecosystem function. (STAT-240/STAT-241/STAT-242 is required for this concentration.)
  - Ecosystem Science (Ballantine, Hoopes): Ecosystem Science is a field and lab-based interdisciplinary science concentration that examines the structure and function of terrestrial and aquatic ecosystems. (STAT-240/STAT-241/STAT-242 is required for this concentration.)
  - Environment and Development (Corson, Farnham, Kebede): The Environment and Development concentration deepens student understanding of the relationship between global environmental issues and human well-being around the world. Courses ranging from the political economy to environmental justice offer students opportunities to explore factors that shape human-environment relations across both the industrialized world and the global South.
  - Environmental Politics, Policy, and Economics (Amy, Corson): The Environmental Politics, Policy, and Economics concentration focuses on the study of the political, economic, historical, and cultural forces that shape environmental policies. Topics include: how environmental policies are made, which interests are most powerful in determining policies, how effective those policies are, and which groups are harmed or helped by those policy decisions.
  - Geoscience (Markley, Werner): Nearly all environmental issues occur near or at the Earth's surface and involve earth materials. A Geoscience concentration introduces students to the geology associated with environmental studies issues.
  - Natural History (Rachootin, Farnham, Savoy): The narratives of the natural world. Students in this concentration study the living worlds that have been and are being evolved, and can, if they wish, connect the living world to the physical processes that shape the Earth and produced the geological record. Planetary science, geology, biology, and physical

anthropology guide these stories. Field experience is often an integral part of this endeavor.

- Nature/Culture/History (Farnham, Savoy): The Nature/Culture/History concentration allows students to explore the changing relationships between human beings and the natural world through time, using the perspectives and tools of the humanities (such as history, ethics, literature, or creative writing). Major aspects of study could include the effects of shifting cultural conceptions of nature on environmental change, how environments affect human communities, and how environments are shaped through cultural and historical change. By integrating different perspectives, students also consider the meanings and representations of "environment" in language and culture.
- Self-designed concentrations require approval by the environmental studies chair.
- Students may take up to two 200- or 300-level courses off campus (study abroad, Five Colleges, etc.). Two additional 200- or 300-level courses may be taken within the Five Colleges. All off-campus courses are subject to advisor approval.
- Environmental studies is an interdisciplinary major. Students who pursue an interdisciplinary major automatically fulfill the College's "outside the major" requirement.

## Requirements for the Minor

A minimum of 20 credits:

ENVST-100	Introduction to Environmental Studies	4
8 credits from the natural sciences (Group A) above the 100 level <sup>1</sup>		8
8 credits from the social sciences and/or humanities (Group B) <sup>1</sup>		8
Total Credits		20

<sup>1</sup> At least one course from Group A or Group B must be at the 300 level

## Additional Specifications

- These courses should be chosen from the list of approved courses. The list is included below and is also available at the department office or website or from any member of the environmental studies faculty. Other courses may be counted toward the minor, with the approval of the environmental studies department chair.
- Courses in the same department as the student's major may not be counted towards the minor in environmental studies.

## Course Advice

In addition to courses in Environmental Studies, many courses for the major and minor in environmental studies are offered by other departments. A list of courses approved for both the major and minor in environmental studies appears below. It is also available at the department office or website, or from any member of the environmental studies faculty.

Appropriate courses taken at Amherst, Hampshire, or Smith colleges or the University of Massachusetts may be counted toward the major or minor with the approval of environmental studies advisor.

Courses taken at other colleges or universities, or through accredited field studies around the world, may also be counted toward the major or minor with the approval of environmental studies advisor. See individual concentrations for recommended off-campus programs.

## Selecting Initial Courses

Students interested in environmental issues should register for Introduction to Environmental Studies (ENVST-100) during their first year. This course is required for both the major and the minor in environmental studies and provides a broad overview of the field. It also gives students a good sense of how to continue their studies in the environmental field.

Other courses that are very useful for first-year students include:

BIOL-145	Introductory Biology	4
or BIOL-160	Integrated Introduction to Biology and Chemistry	
CHEM-101	General Chemistry I	4
or CHEM-160	Integrated Introduction to Biology and Chemistry	
GEOG-105	World Regional Geography	4
GEOG-107	Introduction to the Physical Environment	4
GEOL-103	Oceanography	4
GEOL-107	Environmental Geology	4
PHYS-100	Foundations of Physics	4
PHYS-104	Renewable Energy	4
PHYS-110	Force, Motion, and Energy	4
STAT-140	Introduction to the Ideas and Applications of Statistics	4

A 100-level science course with lab is a required prerequisite for the 200-level science courses that environmental studies majors and minors must take as Group A core courses. A course in statistics—either STAT-140, STAT-240, STAT-241 or STAT-242, or ECON-220, or BIOL-234 (depending on one's concentration within the major) – is also a requirement of the major.

## Intermediate Courses

Intermediate courses for the major and minor and for the student's selected concentration should be chosen from the list of courses approved by the environmental studies faculty. Other courses may be counted toward this requirement with the approval of environmental studies advisor.

## Advanced Courses

All majors must complete ENVST-390, and complete the other 300-level requirements required by their concentration. Independent study (ENVST-395) may be substituted for one of the required advanced courses (though not ENVST-390), with approval of advisor.

## ENVST Course Offerings

### ENVST-100 Introduction to Environmental Studies

*Spring. Credits: 4*

This course introduces students to the field of environmental studies and to some of the scientific, historical, political, economic and cultural aspects of environmental concerns. Through interdisciplinary lenses, we explore the complexities of many issues and problems such as climate change, threats to biodiversity, and toxic environments. In addition to fostering an understanding of their origins, the course focuses on potential solutions.

*Applies to requirement(s): Meets No Distribution Requirement*

*K. Ballantine, T. Farnham*

### ENVST-104 Renewable Energy

*Not Scheduled for This Year. Credits: 4*

We will examine the feasibility of converting the entire energy infrastructure of the US from one that is dependent on fossil fuels to one that utilizes mostly renewable sources of energy. We will examine the potential scale of energy production and the associated costs, natural resource requirements and land usage needs for both renewables, such as solar, wind and biofuel, and non-renewables, such as coal, natural gas, petroleum and nuclear. By applying extensive use of basic algebra and an elementary understanding of the physical processes underpinning each energy technology, we will arrive at a number of urgent conclusions about the challenges facing our energy infrastructure.

*Crosslisted as: PHYS-104*

*Applies to requirement(s): Math Sciences*

*A. Arango*

### ENVST-150 Introductory Topics in Environmental Studies

#### ENVST-150DV Introductory Topics in Environmental Studies:

##### 'Introduction to the Histories and Theories of Development'

*Fall. Credits: 4*

What is so compelling about the idea of development? Why does it fail much of the global south? Do colonialism and capitalism have anything to do with it? Why do hunger, poverty, inequality, unemployment, and ecological crises persist in the so-called developed world? What are the parameters of the proposed solutions to underdevelopment such as neoliberal market reforms versus those of alternative models? What are the connections between development and environmental issues? development and war? Can development be sustainable? Are gender and race incidental or central to these issues? This course engages these questions through readings, lectures, discussions, and writing assignments.

*Applies to requirement(s): Social Sciences*

*K. Surprise*

#### ENVST-150PH Introductory Topics in Environmental Studies:

##### 'Introduction to Environmental and Public Health'

*Fall and Spring. Credits: 4*

This course offers a broad introduction to the problems and solutions in the field of environmental and public health. Students will read about and discuss issues that occur in both industrialized and developing countries. Topics include the biological, physical, and chemical agents of environmental contamination; methods used in epidemiology and toxicology to evaluate environmental hazards; policies currently in place to reduce health risks and protect populations from exposure; and emerging global environmental health problems.

*Applies to requirement(s): Meets No Distribution Requirement*

*J. Albertine*

**ENVST-200 Environmental Science***Fall. Credits: 4*

Most of the environmental challenges we face are complex and interdisciplinary in nature. This course introduces students to the scientific principles, concepts, and methodologies required to both understand the interrelationships of the natural world, as well as to identify and analyze environmental problems and think critically about alternative solutions for addressing them. Key concepts from ecology, biogeochemistry, and other scientific fields inform our study of climate change, water resources, soil sustainability, food production, and other topics. Fundamental and emerging issues are examined using regional case studies, hands-on problem solving, and field and laboratory experiments.

*Applies to requirement(s): Math Sciences**K. Ballantine**Prereq: One 100-level lab science. Coreq: ENVST-200L.**Advisory: One course in statistics is recommended.***ENVST-210 Political Ecology***Fall. Credits: 4*

This course will explore the historical, political, economic, social, and cultural contexts in which human-environment interactions occur. We will cover critical topics and trends in the field of political ecology, from its early manifestations to more recent expansions. Using case studies from the global south and north, we will discuss factors that shape social and environmental change across scales from the personal to the global, and we will examine the role of gender, race, class, and power in struggles over resources. Students will become familiar with the academic debates in which political ecologists are engaged, and they will apply the concepts discussed in a case of their choice.

*Applies to requirement(s): Social Sciences; Multicultural Perspectives**Other Attribute(s): Writing-Intensive**K. Surprise**Restrictions: Course limited to sophomores, juniors and seniors***ENVST-233 Topics in Environmental Studies****ENVST-233AE Topics in Environmental Studies: 'Philosophical Issues Concerning Animals'***Spring. Credits: 4*

Who are non-human animals? In this course, we will think about this question and others – specifically about the ethical relationship "human animals" have to these beings. We will ask such questions like: What are the philosophical – especially the ethical – implications of the scientific research on non-human animals? What determines the quality of life of any animal – human or nonhuman? What obligations do we have to non-human animals? Our answers to these questions will have implications for human businesses, our diet, our pets, our legal system, and, ultimately, how we think about ourselves as 'human animals.' The course format consists of lecture, discussion, regular writing and the possibility of a class presentation.

*Crosslisted as: PHIL-250AE**Applies to requirement(s): Humanities**Other Attribute(s): Writing-Intensive**T. White***ENVST-233EP Topics in Environmental Studies: 'Environmental Pollution'***Spring. Credits: 4*

Humans are increasing the amount of pollutants in the environment, particularly through the burning of fossil fuels and other industrial practices. As human population increases exponentially, our consumption and production of waste and pollution do the same. This class will investigate where the pollutants come from, their presence in the environment, and the biological effects of these pollutants. There will be a special emphasis on how the pollutants that humans produce feed back to affect human health. While this class is primarily science based, we will also address topics in environmental justice and environmental policy.

*Applies to requirement(s): Math Sciences**Other Attribute(s): Writing-Intensive**J. Albertine**Prereq: ENVST-100, ENVST-150PH, or other 100-level science course.***ENVST-233ET Topics in Environmental Studies: 'Environmental Ethics'***Not Scheduled for This Year. Credits: 4*

A fundamental problem we face as humans is how we should relate to the natural world. Why not turn Yosemite into a parking lot? Should we control nature by applying scientific and technological expertise? Or should we strive for noninterference and preservation of the wild? How do we balance the pressing needs of people for food, energy, and other resources with the needs of other species or whole ecosystems?

*Crosslisted as: PHIL-260ET**Applies to requirement(s): Humanities**A. Arden***ENVST-233RV Topics in Environmental Studies: 'Rivers and Society'***Spring. Credits: 4*

In this course, you will think like a river scientist, evaluate societal issues related to rivers, and learn to communicate these points to a general audience. The course is organized around broad topics in river science: river migration, floods, deltas, human water usage, river ecology, and dams. Case studies will include the Yellow River in China, the Mississippi River and Hurricane Katrina, water rights in the southwest U.S. and Mexico, and the Elwha River dam removals in the Pacific northwest (with Skype lectures from Lower Elwha Klallam Tribe scientists).

*Crosslisted as: GEOL-241RV**Applies to requirement(s): Meets No Distribution Requirement**V. Leung**Prereq: Any science, math, or geography course.***ENVST-237 Native American History Through 1865***Not Scheduled for This Year. Credits: 4*

This course surveys Native American history from ancient times through the U.S. Civil War, tracing the ways that tribal communities have shaped North America. Beginning with the diverse indigenous societies that inhabited the Americas millennia before Columbus's arrival, it discusses the cultural complexity of Native peoples, nations, and worldviews rooted in particular ecosystems and homelands. It moves through the early modern era of European scientific exploration and "discovery" of a New World, and the pivotal violences of the "Indian Wars" of the seventeenth, eighteenth, and early nineteenth centuries.

*Crosslisted as: HIST-235**Applies to requirement(s): Humanities; Multicultural Perspectives**C. DeLucia*

**ENVST-240 The Value of Nature**

*Not Scheduled for This Year. Credits: 4*

Through this seminar, students develop an in-depth knowledge of and articulate vocabulary for the significant and diverse ways that humans value the natural world - utilitarian, scientific, aesthetic, naturalistic, symbolic, ethical, and spiritual. We use these different typologies of human environmental values as frameworks for readings and discussion, extending our examination to historical and cultural variations in values, competing perspectives of the natural world, and other value concepts, including intrinsic and transformative value. We examine the concept of biophilia and probe the role values play in the concern over losses of biological diversity and its implications.

*Applies to requirement(s): Humanities*

*T. Farnham*

*Prereq: ENVST-100.*

*Notes: gateway course for minor in Conceptual Foundations of Science*

**ENVST-241 Environmental Issues**

*Spring. Credits: 4*

In this course, we will explore the different facets of numerous environmental policy issues and review the substantive aspects, legal themes, and regulatory structure of the major federal environmental laws. The laws covered in this course include the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, the Endangered Species Act, and others. The course objectives are for the student to learn the basic regulatory characteristics of the major laws and to become well-versed in the current environmental issues which we will focus upon throughout the semester, such as global climate change, ocean degradation, energy resources, and biodiversity loss.

*Applies to requirement(s): Meets No Distribution Requirement*

*T. Farnham*

*Prereq: ENVST-100, or ENVST-150PH, or ENVST-150DV.*

**ENVST-242 Global-Local Inequality and the Environment**

*Spring. Credits: 4*

This course will engage students in thinking about the dynamic relationship between inequality and the environment. We will examine some of the major theories, paradigms, concepts, policies, and programs that analyze, explain, predict or attempt to affect change in the global South. As we discuss the evolution of development theories and practices over time, we will reflect on how its theoretical underpinnings help us to understand policy and programmatic "successes" and "failures." The first part of the course introduces students to philosophical and theoretical debates about inequality and resource access, drawing on development theory to explore evolving approaches to integrate environment and development. We will consider complementary and contrasting perspectives about the causes of and solutions to global poverty and environmental degradation and reflect on how our assumptions shape what we "see" in specific sites, how we frame particular problems and what we suggest as solutions. As we trace approaches to sustainable development from global environmental politics to site-specific case studies, the second half of the course connects through a series of virtual conversations about inequality and the environment with the Mount Holyoke College program in Costa Rica.

*Applies to requirement(s): Social Sciences; Multicultural Perspectives*

*C. Corson*

*Restrictions: Course limited to sophomores, juniors and seniors*

*Prereq: One course in geography or one related social sciences course.*

**ENVST-243 Rural Prosperity in the African Past**

*Fall. Credits: 4*

This course seeks to understand what relationships engendered rural prosperity in African communities in the past, and what processes of change have led millions of rural people to abandon their homes and livelihoods to join flows of migrants to cities and other nations. We examine African patterns of production over the long term and the transformation of African agriculture in the last two centuries, considering famine, the social and political organization of access to productive resources, and the relationship of rural and urban communities. We ask how rural prosperity might be recreated in the 21st century.

*Crosslisted as: HIST-243, AFCNA-243*

*Applies to requirement(s): Humanities; Multicultural Perspectives*

*Other Attribute(s): Community-Based Learning*

*H. Hanson*

**ENVST-267 Reading and Writing in the World**

*Not Scheduled for This Year. Credits: 4*

An introduction to reading and writing about nature, this seminar will attempt an exchange across distinct approaches to observing and describing the world around us. Do lenses of culture, discipline, and gender determine how we see and experience nature, environment, and place? Course work will include reading such authors as N. Scott Momaday, Henry David Thoreau, bell hooks, Leslie Marmon Silko, Mary Oliver, Terry Tempest Williams, Wendell Berry, and Annie Dillard; field trips; and writing assignments--weekly field notes and journals, analytical papers, and personal essays.

*Crosslisted as: ENGL-267*

*Applies to requirement(s): Humanities*

*Other Attribute(s): Writing-Intensive*

*L. Savoy*

*Instructor permission required.*

*Advisory: You must apply for admission to this course by completing the online application form*

**ENVST-271 Place and Power in the American West and Pacific World**

*Spring. Credits: 4*

The vast region of North America between the Mississippi River and Pacific Ocean has been a site of many migrations, conflicts, political transformations, and environmental changes. This course examines dynamic histories of Native American tribes, Euro-American "explorers" and colonists, cowboys and miners, Asian immigrant laborers, and mariners, all of whom helped create interior and oceanic worlds. It focuses on natural and human changes in specific locales, and also explores how public histories at these places shape the present and future.

*Crosslisted as: HIST-271*

*Applies to requirement(s): Humanities; Multicultural Perspectives*

*C. DeLucia*

**ENVST-295 Independent Study**

*Fall and Spring. Credits: 1 - 4*

*The department*

*Instructor permission required.*

**ENVST-301 History of Energy***Spring. Credits: 4*

We live in an age of energy crises, in which the future of energy is questioned in countless headlines and Twitter feeds. Often our energy agony accompanies other assumptions about energy's past, in particular the idea that social change invariably follows the discovery of new energy technologies. From food to fuel cells, this colloquium charts a more complicated and interesting history, a history in which people have continually shaped and made meaningful the energies that fuel the modern world. It will be of particular interest to students in history and environmental studies and to those interested in the social study of science and technology.

*Crosslisted as: HIST-301HE**Applies to requirement(s): Humanities**Other Attribute(s): Speaking-Intensive, Writing-Intensive**D. Fitz-Gibbon***ENVST-315 Research, Ethics and Policy in Environmental Studies***Not Scheduled for This Year. Credits: 4*

Designed to promote curriculum-to-career, this hands-on course prepares students for independent research, research internships, or research careers. Student pick topics of interest and share weekly assignments. Over the course of the semester, we examine methods for designing research and for gathering and analyzing information, and we discuss using data to inform policy. We speak with Mount Holyoke alumnae who have conducted research during internships, for honors theses and independent study, or for policy institutes after graduating. Finally, we consider ethical issues, from gendered experiences to cross-cultural research, and students prepare institutional review board proposals. Students from various disciplines are welcome.

*Applies to requirement(s): Social Sciences**Other Attribute(s): Writing-Intensive**C. Corson**Prereq: 8 credits of 200 level social science or humanities courses**Notes: Meets the ES politics and policy, environment and development, and conservation concentration requirements.***ENVST-316 Restoration Ecology***Spring. Credits: 4*

A key test of our ecological knowledge is whether we can successfully apply it to create or restore ecosystems that have been damaged or destroyed. As we take on the role of restoration ecologists this semester, we will use principles and methods of ecology, conservation biology, hydrology, soil science, and related disciplines to learn about the theory, practice, and politics of ecosystem restoration. This course emphasizes fieldwork, interdisciplinary teamwork, and ecological planning to evaluate and design restoration projects in our surrounding communities and regional landscapes. On a few occasions, meetings may last until 5:05 pm so that we can go on fieldtrips that are farther from campus.

*Applies to requirement(s): Math Sciences**Other Attribute(s): Community-Based Learning**K. Ballantine**Prereq: ENVST-200 or at least 8 credits of 200 or 300-level laboratory science.***ENVST-317 Perspectives on American Environmental History***Not Scheduled for This Year. Credits: 4*

We explore the history of human-environment interactions in North America from precolonial times to the present from different cultural perspectives. How have such human activities as migration, colonization, and resource use depended on or modified the natural world? How have different cultural perceptions of and attitudes toward environment shifted through time and helped to reshape American landscapes? Case studies include ecological histories of Native America and Euro-America, slavery and land use, wilderness and conservation, and environmental racism and social justice. Our approach entails historical review of scientific studies, literature, visual records, and oral tradition.

*Crosslisted as: HIST-317**Applies to requirement(s): Humanities**Other Attribute(s): Speaking-Intensive, Writing-Intensive**L. Savoy**Instructor permission required.***ENVST-321 Conference Courses in Environmental Studies**

Selected topics in areas of environmental interest, determined by faculty expertise and student needs. Study in small groups or by individual students working with faculty.

**ENVST-321CF Conference Courses in Environmental Studies: 'The Challenges of Feeding Nine Billion People'***Fall. Credits: 4*

Human population is expected to surpass nine billion in the next century. As our population grows, so will our need for food. Land available to grow food will not increase and degrading environmental conditions will make adequate food production on this land increasingly difficult. We will focus on the challenges to meet the nutritional needs of a growing population as well as look at some of the possible solutions for the future from a scientific standpoint. These challenges/solutions will be investigated at both the world and local (northeast United States) scales. In addition to being a heavily science-based class on food security, we will also address issues of food justice and environmental justice.

*Applies to requirement(s): Math Sciences**J. Albertine**Prereq: Environmental Studies 200 or other 200 level biological or plant science class.*

**ENVST-321CP Conference Courses in Environmental Studies: 'Political Economy of the Environment: Capitalism and Climate Change'***Spring. Credits: 4*

Can an economic system predicated on infinite growth achieve sustainability on a finite planet? This question will likely define the twenty-first century. This course aims to grapple with this paradox, examining the relationships and tensions between the globally dominant form of economy - capitalism - and global climate change. We will explore the interwoven rise of capitalism and emergence of fossil fuel energy, as well as the global expansion of capitalism and the connections between resources, economic growth, and political power. We will engage with various theoretical approaches to capitalism-environment relations, such as metabolic rift theory, the second contradiction of capitalism, and the production of nature thesis. These theories provide insight into recent forms of capitalism (i.e. neoliberalism) and the increasing degradation and commodification of the environment. We end by studying contemporary debates, examining institutions and policies seeking to manage climate change from with liberal-capitalist frameworks, the emergence of the "green economy", and the politics of climate denialism, concluding with alternatives economies and the climate justice movement. This course will provide students with theoretical knowledge and analytical skills for understanding economy-environment relationships.

*Applies to requirement(s): Social Sciences**K. Surprise**Restrictions: Course limited to sophomores, juniors and seniors***ENVST-321HC Conference Courses in Environmental Studies: 'Human Health and Climate Change'***Spring. Credits: 4*

Climate change presents a global public health problem, with serious health impacts predicted to manifest in varying ways in different parts of the world. Through this course, we will investigate these health effects which include increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme heat, weather, and other disaster events, and changes in the prevalence and geographical distribution of food- and water-borne illnesses and other infectious diseases. We will critically review the literature documenting recent and current impacts and predictions for the future. We will also look at solutions in place for adapting to these changes.

*Applies to requirement(s): Math Sciences**J. Albertine**Prereq: ENVST-200.***ENVST-321TX Conference Courses in Environmental Studies: 'Toxic Entanglements: Environmental (In)Justice in the United States'***Fall. Credits: 4*

Toxic water in Flint, Michigan. Oil pipelines through sacred sites in North Dakota. These manifestations of environmental injustice and inequality are only the most recent incarnations of larger legacies. Environments are never simply natural or given: they are imbued with unequal entanglements of gender, race, class, and power. Environmental justice asks questions about the ways in which environments are produced, and the relations of risk, harm, benefit, access, privilege, domination, oppression, and liberation therein. In this course, we will study the theory and practice of environmental (in)justice in the United States. We will briefly explore histories of environmental injustice in the U.S. (from colonization and slavery, to industrialization and pollution); past and current struggles over the siting of production facilities, toxic waste, and pollution; and recent events around water (be they floods, toxicity, or protection): Hurricane Katrina, Flint, and Standing Rock. We will pay particular attention to questions of food and justice, examining gender, race, and class in agricultural labor, corporate power in agribusiness, food deserts, food access/health and white privilege, and gender in alternative community food movements.

*Applies to requirement(s): Social Sciences**K. Surprise**Restrictions: Course limited to sophomores, juniors and seniors**Prereq: 4 credits from a related subject.***ENVST-335 Wetlands Ecology and Management***Not Scheduled for This Year. Credits: 4*

Although they cover ~0.6% of the earth's surface, wetlands perform more ecosystem services per hectare than any other ecosystem type. Alarmingly, over half of the earth's wetlands have been lost to agriculture and development. With these wetlands were also lost the valuable ecosystem functions wetlands perform. This course takes an interdisciplinary approach to examine the biogeochemical, ecological, societal, and regulatory aspects of wetland ecosystems. Group discussion of primary scientific literature, as well as independent experimental design and the writing of a research proposal are core components. Field trips will sometimes keep us until 5:05 pm, and will provide an opportunity to explore these fascinating ecosystems in person.

*Applies to requirement(s): Math Sciences**K. Ballantine**Prereq: ENVST-200 or at least 8 credits of 200- or 300-level laboratory science.***ENVST-337 Interdisciplinary Perspectives on Environment and Development***Not Scheduled for This Year. Credits: 4*

This course will engage students in interdisciplinary thinking about the dynamic relationship between environment and development. Focusing on specific case studies, we will consider complementary and contrasting perspectives about the causes of and solutions to global poverty and environmental degradation. We will examine how development theories and practices have changed over time, and we will reflect on how our assumptions shape what we "see" in specific sites, how we frame particular problems and what we suggest as solutions. The course is designed as a curriculum-to-career course in which students build practical skills for international development careers.

*Applies to requirement(s): Social Sciences**The department**Restrictions: This course is open to Juniors and Seniors.*

**ENVST-341 Science and Power in Environmental Governance***Not Scheduled for This Year. Credits: 4*

This course applies concepts from political ecology to study how governance, broadly defined, works in relation to the environment. Using case studies of international environmental issues, we will explore how people make decisions about the environment in a policy realm. We will discuss the role of various agents, such as governments, scientific bodies, and nongovernmental organizations, in the decision-making process. We will reflect on who has access to decisions; how scientific data is used; how environmental ideas become powerful; and how policies are legitimated. Armed with this information, we will consider how to advocate for global environmental sustainability and social equity.

*Applies to requirement(s): Social Sciences**The department**Restrictions: Course limited to sophomores, juniors and seniors***ENVST-342 Living in the Anthropocene: Development, Technology, Futures***Spring. Credits: 4*

The concept of the Anthropocene (the "human epoch") signifies that human activity has become the dominant physical force on the planet. Mainstream narratives envision three phases of the Anthropocene: industrial origins (1800 - 1950); global expansion and the nuclear age (1950 - 2000+); and an emergent third phase marked by massive shifts in land-use and biodiversity. This course undertakes a critical examination of the Anthropocene concept. We will analyze debates over geological demarcation, the term itself and the "anthropos" it embodies, and eco-modernist conceptions of a "good" Anthropocene. We aim to historically contextualize the socio-technical phases of the Anthropocene (industrial revolution, post-WWII global expansion, and contemporary globalization), situating them as processes emerging within a specific political-economic context (capitalism). Finally, we examine struggles over the socio-ecological entanglements shaping its future directions: urbanization, industrialized agriculture, genetic technology, and geoengineering/Earth System management. This course explores what it means to live in an era where a subset of one species can determine the conditions of possibility for life on the entire planet.

*Applies to requirement(s): Social Sciences**Other Attribute(s): Speaking-Intensive, Writing-Intensive**K. Surprise**Restrictions: Course limited to sophomores, juniors and seniors***ENVST-343 Applied Environmental Geology***Spring. Credits: 2*

This 2-credit field-based course focuses on assessing the environmental impact of applied road salt in two local hill towns. Each week we will work to measure stream discharge, stream water quality, and measure soil water and snow bank salinity. Each student will pursue their own independent research project but will work collaboratively with other students in the class.

*Crosslisted as: GEOL-343**Applies to requirement(s): Meets No Distribution Requirement**A. Werner**Prereq: GEOL-123 or ENVST-200.**Notes: Half semester.***ENVST-373 Nature and Gender****ENVST-377 Cartography and Exploration in Early North America***Fall. Credits: 4*

This course examines the history of mapping: what maps show, and what places the practice of cartography tends to erase, distort, or conceal. It focuses on the landscapes of early North America, where the representation and use of space was hotly contested by Natives, European settlers, and Africans. The course's topics include indigenous mapping traditions and concepts of sacred space, European navigational strategies during the 'Age of Discovery,' early urban planning, and scientific/military depictions. The course will teach strategies for employing maps as primary sources, and ways of understanding the historical and ideological circumstances of their production and circulation.

*Crosslisted as: HIST-373**Applies to requirement(s): Humanities; Multicultural Perspectives**C. DeLucia**Restrictions: This course is open to Juniors and Seniors.**Notes: meets history department pre-1750 requirement***ENVST-390 Senior Seminar in Environmental Studies***Fall. Credits: 4*

This is the capstone course of the environmental studies major. The course explores linkages among the diversity of disciplines that contribute to the environmental studies major, illustrates how these disciplines that contribute to the environmental studies major are used in environmental decision making, enables students to inform one another's roles as environmentalists, and provides students with opportunities to develop individual and cooperative projects.

*Applies to requirement(s): Meets No Distribution Requirement**Other Attribute(s): Community-Based Learning**T. Farnham**Restrictions: This course is limited to ENVST Majors.***ENVST-395 Independent Study***Fall and Spring. Credits: 1 - 8**The department**Instructor permission required.*

## Courses Approved as Core Intermediate Courses

### Group A: Natural Sciences

#### Biological Sciences

BIOL-200	Introductory Biology II: How Organisms Develop	4
BIOL-223	Ecology	4
BIOL-226	Evolution	4
BIOL-236TA	Topics in Biological Sciences: 'Biology of Terrestrial Arthropods'	4
BIOL-310	Invertebrate Zoology	4
BIOL-315	Behavioral Ecology	4
BIOL-325	Plant Diversity and Evolution	4
BIOL-331	Theory and Application of Conservation Biology	4

#### Chemistry

CHEM-201	General Chemistry II	4
CHEM-202	Organic Chemistry I	4

#### Environmental Studies

ENVST-200	Environmental Science	4
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ENVST-233EP	Topics in Environmental Studies: 'Environmental Pollution'	4	ENVST-321TX	Conference Courses in Environmental Studies: 'Toxic Entanglements: Environmental (In)Justice in the United States'	4
ENVST-233RV	Topics in Environmental Studies: 'Rivers and Society'	4	ENVST-337	Interdisciplinary Perspectives on Environment and Development	4
ENVST-316	Restoration Ecology	4	ENVST-341	Science and Power in Environmental Governance	4
ENVST-321CF	Conference Courses in Environmental Studies: 'The Challenges of Feeding Nine Billion People'	4	ENVST-342	Living in the Anthropocene: Development, Technology, Futures	4
ENVST-321HC	Conference Courses in Environmental Studies: 'Human Health and Climate Change'	4	<b>Geography</b>		
ENVST-335	Wetlands Ecology and Management	4	GEOG-204	Human Dimensions of Environmental Change	4
<b>Geography</b>			GEOG-304UP	Planning and the Environment: 'Urban Planning'	4
GEOG-205	Mapping and Spatial Analysis	4	GEOG-313	Third World Development	4
GEOG-230	Environmental Soil Science	4	GEOG-319	Africa: Problems and Prospects	4
<b>Geology</b>			<b>Geology</b>		
GEOL-201	Rocks and Minerals	4	GEOL-326	Seminar: Global Climate Change	4
GEOL-202	History of Earth	4	<b>Latin American Studies</b>		
GEOL-227	Groundwater	4	LATAM-389	Agrarian America: Sugar, Cotton, Coffee, Bananas, and Wheat	4
GEOL-240	Geological Resources and the Environment	4			
GEOL-241RV	Topics in Geology: 'Rivers and Society'	4			

## Group B: Humanities and Social Sciences

### Humanities

#### Art Studio

ARTST-267	Papermaking with Local Plants	4
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#### English

ENGL-267	Reading and Writing in the World	4
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#### Environmental Studies

ENVST-233AE	Topics in Environmental Studies: 'Philosophical Issues Concerning Animals'	4
ENVST-233ET	Topics in Environmental Studies: 'Environmental Ethics'	4
ENVST-240	The Value of Nature	4
ENVST-267	Reading and Writing in the World	4
ENVST-271	Place and Power in the American West and Pacific World	4
ENVST-301	History of Energy	4
ENVST-317	Perspectives on American Environmental History	4

#### History

HIST-256HC	Environmental History: 'The Columbian Exchange: Global Perspectives on History, Culture, and Nature, 1492 to 1914'	4
HIST-317	Perspectives on American Environmental History	4

### Social Sciences

#### Environmental Studies

ENVST-210	Political Ecology	4
ENVST-237	Native American History Through 1865	4
ENVST-241	Environmental Issues	4
ENVST-242	Global-Local Inequality and the Environment	4
ENVST-315	Research, Ethics and Policy in Environmental Studies	4
ENVST-321CP	Conference Courses in Environmental Studies: 'Political Economy of the Environment: Capitalism and Climate Change'	4