# Environmental Studies

Deb Clark, Tomson 283
507-786-3907
clarkd@stolaf.edu
wp.stolaf.edu/environmental-studies (http://wp.stolaf.edu/environmental-studies)

Environmental studies explores the relationships between the earth's natural systems and physical systems, human political, economic, and social systems, and human understanding of the environment as informed by ethics, philosophy, art, history, religion, and literature. The Department of Environmental Studies seeks to create a teaching and learning community that promotes an integrated understanding of humankind's relationship to the environment. It does this by encouraging rigorous study of the biological and physical processes that characterize the physical environment and those ways in which human activity can promote or compromise the environment's overall health; critical examination of the political, economic, and social institutions that frame human interaction with the environment; and scholarly engagement with those philosophical, spiritual, literary, and artistic traditions that inform and reflect our understanding of the environment and our relationship to it.

## Overview of the Major

Environmental studies combines the strengths of disciplinary work in contributing departments with interdisciplinary studies, giving both broad and focused perspectives on environmental problems, issues, and solutions. The program offers a major with three areas of emphasis through which students choose to focus their work: natural sciences, social sciences, and arts and humanities. In many cases work in these areas of emphasis overlaps with traditional departmental curricula, and students choose to complete a second major there. Recognizing the global dimensions of numerous environmental problems and the need for learning outside of the classroom, the program provides a number of opportunities for studies abroad and in the field.

All students majoring in environmental studies take twelve required courses, including an introductory course that emphasizes the interdisciplinary nature of environmental questions and lays the groundwork for the major, and a capstone senior seminar course that challenges students to integrate and apply what they have learned throughout their studies. The major also requires students to participate in an approved experience that applies basic knowledge in a setting beyond the classroom. Typically this takes the form of an off-campus environmental studies course or program, an internship, or a research project. Students wishing to count courses not specifically designated as satisfying requirements for the major must consult the chair no later than one semester prior to enrollment.

The department offers a concentration in environmental studies for students wishing to complement another major with a suite of courses focused on the environment.

## Intended Learning Outcomes for the Major (http://wp.stolaf.edu/curriculum-committee/environmental-studies-major-ilos)

## Distinction

See Academic Honors (http://catalog.stolaf.edu/academic-regulations-procedures/academic-honors/#distinction)

## Special Programs

A number of off-campus programs include an internship or independent study component in which students may elect to focus on environmental issues. Students must consult with the environmental studies chair in planning their programs and must receive approval before counting work from off-campus programs toward an environmental studies major or concentration. The programs listed below have a substantial focus in environmental studies and will generally contribute to the satisfaction of environmental studies major requirements:

- Agriculture and Justice: Building a Sustainable Food System (HECUA in Minneapolis/St. Paul)
- Biology in South India
- Environmental Science in Australia
- Environmental Sustainability: Science, Public Policy, and Community Action (HECUA in Minneapolis/St. Paul)
- Ecology and Human Origins (ACM in Tanzania)
- Field Research in the Environment, Social Sciences, and Humanities (ACM in Costa Rica)
- Washington Semester in International Environment and Development (American University)
- Wilderness Field Station (Coe College)

## Requirements

## Environmental Studies Major

### Requirements for the Major

| | | |
|---|---|---|
| ENVST 137 | Introduction to Environmental Studies | 1.00 |
| Senior Capstone: | | |
| ENVST 399 | Seminar in Environmental Studies | 1.00 |
| Experiential Component: | | |
| All students majoring in environmental studies must participate in an experience that applies basic knowledge in a setting beyond the classroom. Guidelines and procedures are posted on the department website. | | |
| Ten courses in chosen area of emphasis: | | 10.00 |

| | | |
|---|---|---|
| Select ten additional courses specific to the area of emphasis chosen (natural science, social science, or humanities). Unless permission is granted by the chair, a course may not count for more than one requirement in the major. | | |
| Total Credits | | 12 |

### Areas of Emphasis in the Environmental Studies Major

### Natural Science

The natural science area of emphasis seeks to give students a broad exposure to the range of problems encountered by scientists working in environmental fields and the investigative tools they use, while providing a solid foundation for further study in one of the contributing disciplines. Students planning careers in environmental science are strongly urged to consider an additional major in biology or chemistry. Ten courses are required in addition to the introductory and capstone courses specified above:

| | | |
|---|---|---|
| Select two social sciences courses of the following: | | 2.00 |
| ES/PS 201 | Topics in Global Environmental Politics | |
| ES/PS 225 | Environmental Political Theory | |
| ENVST 232 | Environmental Policy and Regulation | |
| ENVST 235 | Sustainable Development | 1.00 |
| ES/PS 276 | Environmental Politics | |
| AS/ES 277 | Environmental Sustainability in Japan (abroad) | |
| ENVST 281 | Topics in Environmental Studies (when taught with social science focus and approved by the chair) | |
| or ENVST 381 | Advanced Research Topics in Environmental Studies | |
| ECON 242 | Environmental Economics | |
| PSCI 221 Environmental Policy (Environmental Science in Australia) | | |
| PSYCH 227 | Environmental Psychology at Rocky Mountain National Park (off-campus) | |
| SOAN 222 Cultural Anthropology (Environmental Science in Australia) | | |
| SOAN 297 Topics when taught as Environmental Anthropology | | |
| Select two arts and humanities courses of the following: | | 2.00 |
| ENVST 202 | The Culture of Nature | |
| ENVST 222 | Campus Ecology | |
| ENVST 270 | Nature and American Landscapes | |
| ENVST 281 | Topics in Environmental Studies (when taught with arts and humanities focus and approved by the chair) | |
| or ENVST 381 | Advanced Research Topics in Environmental Studies | |
| HIST 245 | Environmental History of Latin America | |
| HIST 275 | Environmental History | |
| PHIL 257 | Environmental Ethics [1] | |
| or REL 278 | Christian Ethics and Ecological Justice | |
| ENGL 276 | Literature and the Environment | |
| Select one statistics modeling and mapping course of the following: | | 1.00 |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| STAT 212 | Statistics for the Sciences | |
| STAT 272 | Statistical Modeling | |
| Select one intermediate chemistry course of the following: | | 1.00 |
| CHEM 248 & CHEM 254 | Organic Chemistry II and Synthesis Laboratory II (0.25) | |
| CHEM 255 & CHEM 256 | Analytical Chemistry and Analytical Laboratory (0.25) | |
| Select one intermediate ecology course of the following: | | 1.00 |
| BIO 261 | Ecological Principles | |
| BIO 226 Terrestrial Ecology (Environmental Science in Australia) | | |
| Select two environmental science courses of the following: [2] | | 2.00 |
| ENVST 123 | Geophysics: Perspectives on the Dynamic Earth | |
| BI/ES 226 | Conservation Biology | |
| BI/ES 228 | Environmental Health | |
| ENVST 245 | Global Climate Change | |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| ENVST 281 | Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| BI/ES 286 | Tropical Ecology and Sustainable Land Use in Costa Rica (abroad) | |
| BI/ES 350 | Biogeochemistry: Theory and Application | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with environmental science focus and approved by the chair) | |
| ENVST 396 | Directed Undergraduate Research | |
| BIO 224 Marine Ecology (Environmental Science in Australia) | | |
| BIO 371 | Field Ecology | |

| | | |
|---|---|---|
| BIO 391 | Selected Topics (when taught with environmental science focus and approved by the chair) | |
| CHEM 391 | Selected Topics in Chemistry (when taught with environmental science focus and approved by the chair) | |
| Select one level III course in environmental science: | | 1.00 |
| BI/ES 350 | Biogeochemistry: Theory and Application | |
| BIO 371 | Field Ecology | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| Total Credits | | 11 |

[1] Student pursuing a natural science area of emphasis may not count both PHIL 257 and REL 278.

[2] One of these two courses must carry Environmental Studies Departmental designation.

### Social Science

The social science area of emphasis seeks to provide students with a broad exposure to the methods and models employed by social scientists working in the environmental field. In addition to the introductory and capstone courses (specified above), students select ten additional courses from the following groups:

| | | |
|---|---|---|
| Select two natural science courses of the following: [1] | | 2.00 |
| ENVST 123 | Geophysics: Perspectives on the Dynamic Earth | |
| ENVST 245 | Global Climate Change | |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| ENVST 281 | Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| BI/ES 226 | Conservation Biology | |
| BI/ES 228 | Environmental Health | |
| BI/ES 286 | Tropical Ecology and Sustainable Land Use in Costa Rica (abroad) | |
| BI/ES 350 | Biogeochemistry: Theory and Application | |
| BIO 224 Marine Biology (Environmental Science in Australia) | | |
| BIO 226 Terrestrial Ecology (Environmental Science in Australia) [3] | | |
| BIO 261 | Ecological Principles [3] | |
| CHEM 124 | A Matter of the Environment with Lab | |
| CHEM 255 & CHEM 256 | Analytical Chemistry and Analytical Laboratory (0.25) | |
| BIO 391 | Selected Topics (when taught with environmental science focus and approved by the chair) | |
| CHEM 391 | Selected Topics in Chemistry (when taught with environmental science focus and approved by the chair) | |
| Select two art and humanities courses of the following: | | 2.00 |
| ENVST 202 | The Culture of Nature | |
| ENVST 222 | Campus Ecology | |
| ENVST 270 | Nature and American Landscapes | |
| ENVST 281 | Topics in Environmental Studies (when taught with arts and humanities focus and approved by chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with arts and humanities focus and approved by chair) | |
| HIST 245 | Environmental History of Latin America | |
| HIST 275 | Environmental History | |
| PHIL 257 | Environmental Ethics [2] | |
| or REL 278 | Christian Ethics and Ecological Justice | |
| ENGL 276 | Literature and the Environment | |
| Select one methodological analysis course of the following: | | 1.00 |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| STAT 110 | Principles of Statistics | |
| STAT 212 | Statistics for the Sciences | |
| STAT 214 | Honors Statistics for the Sciences | |
| STAT 272 | Statistical Modeling | |
| ECON 263 | Statistics for Economics | |
| SOAN 371 | Foundations of Social Science Research: Quantitative Methods | |
| PSYCH 230 | Research Methods in Psychology | |
| PSCI 220 | Analyzing Politics and Policies | |
| Economic analysis courses: | | |

| | | |
|---|---|---|
| ECON 121 | Principles of Economics (or ECON 110-ECON 120) | 1.00 |
| ECON 242 | Environmental Economics | 1.00 |
| Select one environmental political policy and institutions course of the following: | | 1.00 |
| ENVST 232 | Environmental Policy and Regulation | |
| ES/PS 201 | Topics in Global Environmental Politics | |
| ES/PS 276 | Environmental Politics | |
| Select two social science electives of the following: | | 2.00 |
| ES/PS 201 | Topics in Global Environmental Politics | |
| ES/PS 225 | Environmental Political Theory | |
| ENVST 232 | Environmental Policy and Regulation | |
| ENVST 235 | Sustainable Development | 1.00 |
| ES/PS 276 | Environmental Politics | |
| ENVST 281 | Topics in Environmental Studies (if taught with social science emphasis and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (if taught with social science emphasis and approved by the chair) | |
| ENVST 396 | Directed Undergraduate Research (when taught with social science focus and approved by the chair) | |
| ECON 243 | Economic Development | |
| PSYCH 227 | Environmental Psychology at Rocky Mountain National Park (off-campus) | |
| SOAN 297 Topics when taught as Environmental Anthropology | | |
| PSCI 221 Environmental Policy (Environmental Science in Australia) | | |
| SOAN 222 Cultural Anthropology (Environmental Science in Australia) | | |
| ID 234 | Human Geography of the Middle East | |
| AS/ES 277 | Environmental Sustainability in Japan (abroad) | |
| Total Credits | | 11 |

1 One of these courses must carry Environmental Studies departmental designation.

2 Students pursuing a social science emphasis may not count both PHIL 257 and REL 278.

3 Either BIO 226 (Environmental Science in Australia) or BIO 261 can count for this requirement.

### Arts and the Humanities

The arts and humanities area of emphasis requires ten courses in addition to the introductory and capstone courses.

| | | |
|---|---|---|
| Select two natural science courses of the following: [1] | | 2.00 |
| ENVST 123 | Geophysics: Perspectives on the Dynamic Earth | |
| ENVST 245 | Global Climate Change | |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| ENVST 281 | Topics in Environmental Studies (when taught with Natural Science focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with Natural Science focus and approved by the chair) | |
| BI/ES 226 | Conservation Biology | |
| BI/ES 228 | Environmental Health | |
| BI/ES 286 | Tropical Ecology and Sustainable Land Use in Costa Rica (abroad) | |
| BI/ES 350 | Biogeochemistry: Theory and Application | |
| BIO 224 Marine Biology (Environmental Science in Australia) | | |
| BIO 226 Terrestrial Ecology (Environmental Science in Australia) [2] | | |
| BIO 261 | Ecological Principles [2] | |
| CHEM 124 | A Matter of the Environment with Lab | |
| CHEM 255 & CHEM 256 | Analytical Chemistry and Analytical Laboratory (0.25) | |
| BIO 391 | Selected Topics (when taught with environmental science focus and approved by the chair) | |
| CHEM 391 | Selected Topics in Chemistry (when taught with environmental science focus and approved by the chair) | |
| Select two social science courses of the following: | | 2.00 |
| ENVST 232 | Environmental Policy and Regulation | |
| ENVST 235 | Sustainable Development | 1.00 |
| ENVST 281 | Topics in Environmental Studies (when taught with social science focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with social science focus and approved by the chair) | |
| ES/PS 201 | Topics in Global Environmental Politics | |

| | | |
|---|---|---|
| ES/PS 225 | Environmental Political Theory | |
| ES/PS 276 | Environmental Politics | |
| ECON 242 | Environmental Economics | |
| PSCI 221 | Environmental Policy (Environmental Science in Australia) | |
| PSYCH 227 | Environmental Psychology at Rocky Mountain National Park (off-campus) | |
| SOAN 222 | Cultural Anthropology (Environmental Science in Australia) | |
| AS/ES 277 | Environmental Sustainability in Japan (abroad) | |
| Select five level II courses in the arts and humanities of the following: | | 5.00 |
| ENVST 202 | The Culture of Nature | |
| ENVST 222 | Campus Ecology | |
| ENVST 270 | Nature and American Landscapes | |
| ENVST 281 | Topics in Environmental Studies (when taught with arts and humanities focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with arts and humanities focus and approved by the chair) | |
| HIST 245 | Environmental History of Latin America | |
| HIST 275 | Environmental History | |
| PHIL 257 | Environmental Ethics | |
| ENGL 276 | Literature and the Environment | |
| REL 278 | Christian Ethics and Ecological Justice | |
| Select one level III topics course in arts and humanities of the following: | | 1.00 |
| ENVST 381 | Advanced Research Topics in Environmental Studies | |
| Level III course in another department if taught with an environmental studies arts and humanities focus and approved by the chair | | |
| Total Credits | | 11 |

[1] One of these courses must carry Environmental Studies department designation.

[2] Either BIO 226 (Environmental Science in Australia) or BIO 261 can count for this requirement.

# Environmental Studies Concentration

## Requirements for the Concentration

The environmental studies concentration draws upon the disciplinary strengths of a traditional major and a set of courses focused on the environment. Students may utilize environmental studies-related upper-level courses within their own discipline to complete requirements of the concentration if the courses have a significant component that addresses environmental concerns. Unless permission is granted by the chair, a course may not count for more than one requirement in the concentration. Successful completion of at least 6 courses with a grade of C or better is required.

| | | |
|---|---|---|
| ENVST 137 | Introduction to Environmental Studies | 1.00 |
| Select one natural science course of the following: | | 1.00 |
| ENVST 123 | Geophysics: Perspectives on the Dynamic Earth | |
| ENVST 245 | Global Climate Change | |
| ENVST 255 | Remote Sensing and Geographic Information Systems | |
| ENVST 281 | Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with natural science focus and approved by the chair) | |
| BI/ES 226 | Conservation Biology | |
| BI/ES 228 | Environmental Health | |
| BI/ES 286 | Tropical Ecology and Sustainable Land Use in Costa Rica (abroad) | |
| BI/ES 350 | Biogeochemistry: Theory and Application | |
| BIO 224 | Marine Biology (Environmental Science in Australia) | |
| BIO 226 | Terrestrial Ecology (Environmental Science in Australia) [1] | |
| BIO 261 | Ecological Principles [1] | |
| CHEM 124 | A Matter of the Environment with Lab | |
| CHEM 255 & CHEM 256 | Analytical Chemistry and Analytical Laboratory (0.25) | |
| BIO 391 | Selected Topics (when taught with environmental science focus and approved by chair) | |
| CHEM 391 | Selected Topics in Chemistry (when taught with environmental science focus and approved by the chair) | |
| Select one social science course of the following: | | 1.00 |
| ENVST 232 | Environmental Policy and Regulation | |
| ENVST 235 | Sustainable Development | 1.00 |
| ENVST 281 | Topics in Environmental Studies (when taught with social science focus and approved by the chair) | |

| | | |
|---|---|---|
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with social science focus and approved by the chair) | |
| ES/PS 201 | Topics in Global Environmental Politics | |
| ES/PS 225 | Environmental Political Theory | |
| ES/PS 276 | Environmental Politics | |
| ECON 242 | Environmental Economics | |
| PSCI 221 Environmental Policy (Environmental Science in Australia) | | |
| PSYCH 227 | Environmental Psychology at Rocky Mountain National Park (off-campus) | |
| SOAN 222 Cultural Anthropology (Environmental Science in Australia) | | |
| SOAN 297 Topics when taught as Environmental Anthropology | | |
| Select one arts and humanities course of the following: | | 1.00 |
| ENVST 202 | The Culture of Nature | |
| ENVST 222 | Campus Ecology | |
| ENVST 270 | Nature and American Landscapes | |
| ENVST 281 | Topics in Environmental Studies (when taught with arts and humanities focus and approved by the chair) | |
| ENVST 381 | Advanced Research Topics in Environmental Studies (when taught with arts and humanities focus and approved by the chair) | |
| HIST 245 | Environmental History of Latin America | |
| HIST 275 | Environmental History | |
| PHIL 257 | Environmental Ethics | |
| ENGL 276 | Literature and the Environment | |
| REL 278 | Christian Ethics and Ecological Justice | |
| Electives: Students choose two additional environmental studies courses from among those listed above for the major. This may (but need not) include the senior seminar. Elective courses from other departments must have a significant component that addresses environmental concerns, but they need not have environmental issues as their exclusive focus. For some electives, students may be required to negotiate specific assignments with the instructor and the chair to receive credit toward the concentration. Concentrators may not count both REL 278 and PHIL 257. | | 2.00 |
| Experiential component: All students majoring or concentrating in environmental studies must participate in an experience that applies basic knowledge in a setting beyond the classroom. Guidelines and the procedures are posted on the environmental studies website. | | |
| Total Credits | | 7 |

[1] Either BIO 226 (Environmental Science in Australia) or BIO 261 can count for this requirement.

# Courses

Because of their interdisciplinary character, environmental studies courses are quite appropriate for students seeking to fulfill general education requirements. The introductory course, ENVST 137, serves many students in the IST area, and other environmental studies courses generally fulfill one or more of the general education requirements.

# Courses

**ENVST 123: *Geophysics: Perspectives on the Dynamic Earth***
This course considers a variety of topics in earth and environmental science. Beginning with the origin of the earth and planetary system, the course examines crustal evolution and plate tectonics, geologic resources and hazards, and the relationship of these surface phenomena to processes occurring in the earth's interior. It concludes with a study of the oceans, the atmosphere, the earth's climate system, and environmental change. Offered annually. Counts toward environmental studies major (all emphases) and concentration. **Prerequisite:** proficiency in algebra and geometry.

**ENVST 137: *Introduction to Environmental Studies***
This interdisciplinary course uses basic concepts of environmental science to explore global environmental issues. Topics are drawn from recent texts and current periodic literature, and participants will recognize many of the themes from coverage in the media. Because most environmental problems involve issues beyond the sciences, the class examines the economic, political, and ethical dimensions of environmental questions and environmental decision-making. Offered each semester.

**ES/PS 201: *Topics in Global Environmental Politics***
Population growth, industrialization, and the consumption of fossil fuels have increased global environmental problems. The course examines the ways in which nation-states and/or international institutions have addressed these environmental concerns. Depending on the instructor, the focus of the course is either the environmental problems of a particular area (e.g., Latin America, Russia or Asia) or a broader global arena (e.g., international institutions and the environment). Offered alternate years.

**ENVST 202: *The Culture of Nature***
This American environmental history course explores the social construction of nature in the 21st century, looking at the roots (both natural and cultural) of contemporary environmental issues. To figure out what nature means to us now, students study the history of stuff, the culture of grasslands and lawns, the changing character of the city and the country, the nature of the suburbs, the conservation and preservation movements, different energy ecologies, the nature of TV, the contemporary environmental movement, and alternative ecological practices. They also use the St. Olaf campus as a case study of environmental design. Offered annually. Counts toward American studies major.

**ENVST 222: *Campus Ecology***
This course explores key concepts of ecology, focusing explicitly on the ideal of ecological sustainability for the St. Olaf campus. Students attend both to contemporary environmental issues and to the ideas and institutions that shape human resource use. Working groups research topics such as curriculum, clothes, cars, water, waste, food, energy, procurement, and landscape in the context of American religious and environmental values. Offered annually. Counts toward American studies major.

**ES/PS 225: *Environmental Political Theory***
This course examines relations between conceptions of "nature" and political issues of power, justice, liberty, and equality; and it explores theoretical foundations from which ecologically grounded institutions, policies, and political understandings arise. The course attends to issues currently being addressed by international green political theorists, including "ecological citizenship" and "green democracy." Offered alternate years.

**BI/ES 226: *Conservation Biology***
Conservation biology focuses on the study of biological diversity. Students examine why people should be concerned about the number and types of species on earth, what factors threaten the survival of species, and how people can conserve them. Using principles of ecology and evolution, with input from other disciplines, students gain a better understanding of the impact of humans on biodiversity and the importance of responsible environmental decision-making. Offered annually.
**Prerequisite:** one natural science course.

**BI/ES 228: *Environmental Health***
Human health is affected by the biological environment, a teeming world of parasites and diseases, and the physical environment -- the water, air, and landscapes that we inhabit. Human interactions with the environment have changed rapidly, as human populations grow, travel increases, and ecosystems are altered. This course touches upon traditional environmental topics such as air and water quality, and integrates newer public health challenges such as emerging diseases and food-borne illnesses. Counts toward management studies concentration.
**Prerequisite:** an introductory science course.

**ENVST 232: *Environmental Policy and Regulation***
This course analyzes environmental regulation in the United States with respect to its historical evolution, its ability to achieve environmental targets, its efficiency or cost-effectiveness, its distributional impact on jobs, people, and industries across the country, and its international ramifications. Offered annually. Counts toward management studies concentration.

**ENVST 235: *Sustainable Development***
In this course, students examine the ethical underpinnings of the sustainable development concept; explore the interdependence of society and environment in a variety of contexts (primarily but not exclusively in "developing" countries); learn about the social factors that have led economic growth to be particularly unsustainable, especially with respect to the environment. Counts toward environmental studies major and concentration. Offered annually in the spring semester.
**Prerequisite:** ENVST 137.

**ENVST 245: *Global Climate Change***
This course is an interdisciplinary seminar on climate throughout the earth's history, including recent changes caused by humankind. It examines the climate system in the larger framework of planetary evolution and explores evidence from the geologic record for climates of the past. Using current scientific literature, students investigate causes of climate change and consider scenarios for future climate based on models incorporating alternative global development strategies. Offered annually.
**Prerequisites:** sophomore standing; one level I biology, chemistry, or physics course or ENVST 137 strongly encouraged.

**ENVST 255: *Remote Sensing and Geographic Information Systems***
Remote sensing and GIS are increasingly used to address basic and applied questions in the environmental sciences and a host of other disciplines. Students survey available remote sensing image types and learn to process (ground-truthing, GPS, scanning, digitizing) and interpret remotely sensed images. They also learn theory and practice of geographic information systems (basic cartography and spatial statistics). A weekly three-hour laboratory is required. Offered annually.
**Prerequisites:** ENVST 137 or a level I course in biology, chemistry, or physics.

**ENVST 270: *Nature and American Landscapes***
This seminar-style course develops students' abilities to reflect on Americans' encounters with their landscape traditions. Students study ways Americans have built on the land and have worshipped and represented nature in paintings, photographs, and advertisements. Students learn to read landscapes to discover how artistically, religiously, and ecologically important the landscape tradition has been in the United States and to become thoughtful viewers and creators of landscapes. Counts toward majors: art, American studies, art history, and environmental studies. Counts toward concentrations: American studies and environmental studies. Offered annually.

**ES/PS 276: *Environmental Politics***
Analysis of environmental policy includes the politics of agenda setting, policy selection and program implementation, and the effects of policy outcomes. Offered annually. Counts toward American studies major and management studies concentration.

**AS/ES 277: *Environmental Sustainability in Japan (abroad)***
Students investigate community-based approaches to environmental sustainability during this Interim course taught at the Asian Rural Institute (ARI) in northern Japan. Students explore how ARI builds on local Japanese resources to support its mission of training rural leaders from developing countries in organic agricultural practices. Activities include field trips, discussions, and symposia with Japanese students, as well as hands-on participation in the daily food life at ARI. Counts toward Asian studies and Environmental studies majors and concentrations and Japan studies concentration. Offered during Interim.
**Prerequisites:** preference given to students with prior coursework in either Asian Studies or Environmental Studies.

**ENVST 281: *Topics in Environmental Studies***
Students study topics related to the environment. Topics vary from year to year at the discretion of the instructor. Topics may include Environment and Theology, Environmental Justice, Ecotourism, and Literature of the Poles. Class is largely discussion-based but may include a lab/fieldwork component depending on the topic. May be repeated if topic is different. Offered annually.

**BI/ES 286: *Tropical Ecology and Sustainable Land Use in Costa Rica (abroad)***
This course offers students the opportunity to study first-hand the most diverse ecosystems on earth. In this intensive field-oriented course students explore lowland rainforest, montane forest, dry forest, and coastal and agricultural ecosystems through projects and field trips. Students read and discuss texts and primary literature specific to ecology, evolution, conservation, and agricultural practices of each area, and keep reflective journals. Offered during Interim in alternate years.
**Prerequisite:** one science course.

**ENVST 294: *Academic Internship***

**ENVST 298: *Independent Study***

**ENVST 311: *Global Environmental Issues at Cranfield University, UK (abroad)***
This course provides students with hands-on experience applying scientific information and skills to the development of solutions to specific environmental problems in collaboration with industry and government in the United Kingdom. Students take course modules at Cranfield University, supplemented by sessions led by a St. Olaf faculty member to synthesize information from modules and other readings as well as to develop their oral communication skills for final presentations to the Cranfield community and industry and government partners. Offered during Interim.
**Prerequisites:** ENVST 137 and two level II courses in natural or social sciences.

**BI/ES 350: *Biogeochemistry: Theory and Application***
The study of global change and human environmental impacts requires students to link concepts from biology, chemistry, and physics. Students investigate these links by exploring current theories in biogeochemistry, with an emphasis on understanding the feedback between physical and ecological processes and the coupling of multiple element cycles. Laboratory activities focus on a practical exploration of the methods biogeochemists use, including experience with a variety of instruments. Counts toward mathematical biology concentration.
**Prerequisite:** any level II biology, chemistry, or physics course or permission of instructor.

**ENVST 381: *Advanced Research Topics in Environmental Studies***
Students study topics related to the environment. Topics vary from year to year at the discretion of the instructor. Recent topics offered include Ecosystem Research, Landscape Art, Imaging Environmentalism, and Landscape and Regional Change in the Arctic.

**ENVST 394: *Academic Internship***

**ENVST 396: *Directed Undergraduate Research***
This course provides a comprehensive research opportunity, including an introduction to relevant background material, technical instruction, identification of a meaningful project, and data collection. The topic is determined by the faculty member in charge of the course and may relate to his/her research interests. Offered based on department decision. May be offered as a 1.00 credit course or .50 credit course.
**Prerequisite:** determined by individual instructor.

**ENVST 398: *Independent Research***

**ENVST 399: *Seminar in Environmental Studies***
A capstone seminar for seniors in the major and concentration, this course involves intensive study of special topics utilizing student research projects and presentations. An academic civic engagement project relies on the expertise gained from their environmental studies courses and work in other majors as applicable. Topics relate to a local or regional environmental issues, providing participants with opportunities to interact with government and regulatory agencies and community groups. Offered spring semester.
**Prerequisites:** ENVST 137, senior status, or permission of the environmental studies chair and instructor.

# Environmental Studies Courses in Other Departments

## Natural Sciences

BIO 226 Terrestrial Ecology (Environmental Science in Australia)

BIO 261 Ecological Principles

BIO 371 Field Ecology

CHEM 124 A Matter of the Environment with Lab

CHEM 248 Organic Chemistry II

CHEM 254 Synthesis Laboratory II (0.25)

CHEM 255 Analytical Chemistry

CHEM 256 Analytical Laboratory (0.25)

STAT 110 Principles of Statistics

STAT 212 Statistics for the Sciences

STAT 214 Honors Statistics for the Sciences

STAT 272 Statistical Modeling

## Social Sciences

ECON 121 Principles of Economics

ECON 242 Environmental Economics

ECON 243 Economic Development

ECON 263 Statistics for Economics

ID 234 Human Geography of the Middle East

PSCI 220 Analyzing Politics and Policies

PSCI 221 Environmental Policy (Environmental Science in Australia

PSYCH 227 Environmental Psychology at Rocky Mountain National Park (off-campus)

PSYCH 230 Research Methods in Psychology

SOAN 222 Cultural Anthropology (Environmental Science in Australia)

SOAN 297 Topics in Sociology and Anthropology (when taught as Environmental Anthropology)

SOAN 371 Foundations of Social Science Research: Quantitative Methods

## Arts and the Humanities

ENGL 276 Literature and the Environment

HIST 245 Environmental History of Latin America

HIST 275 Environmental History

PHIL 257 Environmental Ethics

REL 278 Christian Ethics and Ecological Justice

# Faculty

**Chair, 2016-2017**
**Rebecca P. Judge**
Professor of Economics, Associate Dean of Social Sciences
environmental economics; public policy

**Mark Allister**
Professor of English and Environmental Studies
American literature; environmentalism; popular music; men's studies; American studies

**Diane K. Angell**
Assistant Professor of Biology
conservation biology; ecology; evolutionary biology

**Seth I. Binder**
Assistant Professor of Economics and Environmental Studies
environmental and natural resource economics and policy; development economics; applied microeconomics; environmental economics

**Daniel J.B. Hofrenning** (on leave)
Professor of Political Science
American politics; religion and politics; parties and elections; public policy

**Paul T. Jackson**
Associate Professor of Chemistry and Environmental Studies
green chemistry; environmental chemistry; water quality; sustainability

**Anna K. Lindquist**

**Kristina MacPherson** (on leave Interim and spring)
Professor of Asian Studies and Library
reference and instruction librarian, Asian studies

**Donna McMillan**
Associate Professor of Psychology
clinical psychology; personality psychology; environmental psychology; positive psychology

**Anthony R. Pahnke**
Visiting Assistant Professor of Political Science and Environmental Studies
contentious politics; Latin American politics; political economy; environmental studies

**Matthew Rohn**
Associate Professor of Art and Art History and Environmental Studies
19th-and 20th-century art; American culture; gender and multi-cultureal studies; social justice; visual ecocriticism

**Kathleen L. Shea**
Professor of Biology and Environmental Studies, Curator of Natural Lands
plant ecology and evolution; restoration ecology; agroecology

**Charles Taliaferro**
Professor of Philosophy
philosophy of religion; ethics; philosophy of mind; aesthetics

**Charles E. Umbanhowar**
Professor of Biology and Environmental Studies
prairie ecology; botany; paleoecology; fire ecology; biogeochemistry