

# Environmental Studies

## *Interdisciplinary*

The concentration provides an interdisciplinary framework for understanding the interactions of individuals, societies and the natural world. The concentration brings together the different perspectives of the humanities, life sciences, physical sciences and social sciences. The academic program is enhanced by the 450-acre Brown Family Environmental Center (BFEC). The BFEC, within walking distance of campus, features a wide range of natural and managed habitats and includes part of the Kokosing River (one of Ohio's State Scenic Rivers). In addition, Kenyon encourages students to think in more global terms through affiliations with the School for Field Studies and the Organization for Tropical Studies, as well as through off-campus study opportunities like the Duke University Marine Laboratory and the Semester in Environmental Science at Woods Hole. Our goals are to increase basic knowledge in the relevant subjects and to learn techniques for evaluating complex issues, especially those with both technological and social components.

The implications of our interaction with the environment extend well beyond either natural or social sciences, however, as ethics and aesthetics are integral to those interactions. Consequently, the concentration in environmental studies knits together many traditional academic disciplines. The concentration can be integrated with a major in international studies.

## FOR FIRST-YEAR STUDENTS

Students interested in ENVS are encouraged to take ENVS 112 in their first year.

Other appropriate courses for first-year or new students include:

- BIOL 106 Conservation Biology
- BIOL 115 Energy in Living Systems
- CHEM 108 Solar Energy
- ECON 101 Principles of Microeconomics

Other introductory courses in affiliated departments may be taken as interests dictate.

## THE CURRICULUM

The environmental studies program consists of four components:

- ENVS 112

- three semester courses in "core" subjects (biology, chemistry and economics)
- a selection of three courses from affiliated courses in at least two departments
- ENVS 461

## CONCENTRATION REQUIREMENTS

The concentration requires a total of four (4) units. Affiliated courses are offered in anthropology, biology, chemistry, economics, philosophy, physics, political science, religious studies and sociology.

*Required Environmental Studies Courses: One (1) unit*

ENVS 112 Introduction to Environmental Studies

ENVS 461 Seminar in Environmental Studies

*Core Courses in Environmental Studies: One-and-a-half (1.5) units*

BIOL 106 Conservation Biology

BIOL 115 Energy in Living Systems

CHEM 108 Solar Energy

CHEM 110 Environmental Chemistry

CHEM 121 Introductory Chemistry

CHEM 122 Chemical Principles

ECON 101 Principles of Microeconomics

***Elective Courses for Environmental Studies - One-and-a-half (1.5) units from the following courses in at least two departments:***

*Anthropology courses:*

ANTH 111 Introduction to Biological Anthropology

ANTH 320 Anthropology of Food

ANTH 324 Human Ecology: Biocultural Adaptations

ANTH 333 Prehistory of Europe and Western Asia

*Biology courses:*

BIOL 228, 229 Ecology and Ecology Laboratory

BIOL 251 Marine Biology

BIOL 352, 353 Aquatic Systems Biology and Aquatic Systems Lab

*Chemistry courses:*

CHEM 231, 233 Organic Chemistry I and Organic Chemistry Lab I

CHEM 341 Instrumental Analysis

*Economics courses:*

ECON 336 Environmental Economics  
ECON 342 Economics of Regulation  
ECON 347 Economics of the Public Sector

*Environmental Studies courses:*

ENVS 251 Field Experience: Environmental Outreach  
ENVS 253 Sustainable Agriculture  
ENVS 261 Geographic Information Science

*Philosophy courses:*

PHIL 110 Introduction to Ethics  
PHIL 115 Practical Issues in Ethics

*Physics course:*

PHYS 108 Geology

*Political science courses:*

PSCI 361 Globalization  
PSCI 363 Global Environmental Politics  
PSCI 480 Science and Politics

*Religious studies course:*

RLST 481 Religion and Nature

*Sociology courses:*

SOCY 233 Sociology of Food  
SOCY 477Y-478Y Fieldwork: Rural Life

## TRANSFER CREDIT POLICY

Because careful course selection is necessary to achieve specific objectives, students are urged to consult as early as possible with a program co-director and other faculty members in the Environmental Studies Concentration.

A maximum of one (1) unit may be taken off-campus. Students planning to take a course for transfer credit should consult a program co-director in advance.

## Courses

ENVS 104 SOLAR POWER SYSTEMS: SCIENCE, POLICY AND PRACTICUM  
Credit: 0.5

Photovoltaic power generation is proving to be a viable renewable alternative to fossil fuels, and Kenyon College is embarking on a multi-year plan to install PV systems on several buildings across campus. This course is uniquely situated to take advantage of this endeavor. We will discuss the role energy serves in society and examine the basic physics of energy in general before discussing and comparing traditional fossil fuels versus alternatives. Focusing our attention on PV electrical energy, a series of hands-on lab exercises will explore the science of electricity, PV power generation and linking such systems to the grid. Determining potential locations for installing Kenyon's growing network of solar power systems will be addressed via a combination of spatial analysis exercises and on-site visits to past and future installation sites. Additional field trips to local residential and commercial agricultural PV systems and conversations with their owners will augment these efforts. Through conversations with leaders of Kenyon's campus efforts and online virtual meetings with leaders in the industry at the state, regional, and national levels, we will learn the ins and outs of designing, planning, installing, and financing PV systems from the perspectives of buyers, sellers and investors. During semesters when an installation is in process, we will be directly involved in site evaluations and will closely follow along with the design and construction of the system. During these times, students will help plan and will host a public flip-the-switch event at system sites when these new systems are commissioned and are officially energized and connected to the grid. No prerequisite.

#### ENVS 112 INTRODUCTION TO ENVIRONMENTAL STUDIES

Credit: 0.5

This course examines contemporary environmental problems, introducing the major concepts pertaining to human interactions with the biosphere. We will explore this interaction at both local and global scales. Course topics include basic principles of ecology (flows of energy, cycling of matter and the role of feedback), the impacts of human technology, the roots of our perceptions about and reactions to nature, the social and legal framework for responding to problems, and economic issues surrounding environmental issues. We will discuss methods for answering questions regarding the consequences of our actions and, using a systems approach, focus on methods for organizing information to evaluate complex issues. The format of the course will be three-quarters discussion and lecture and one-quarter workshop. The workshops will include field trips, experience with collecting data, and application of systems thinking. This course counts as a biology course for diversification. No prerequisite. Offered every spring.

Instructor: Staff

#### ENVS 251 FIELD EXPERIENCE: ENVIRONMENTAL OUTREACH

Credit: 0.13

In this course, students will examine special topics in environmental science, gaining subject knowledge so that they can lead educational experiences for elementary school classes visiting the Brown Family Environmental Center. Students will participate in two workshops at the beginning of the semester and then participate in at least four programs for visitors. Participants will keep a journal and submit a final report on their experiences along with evaluations of the effectiveness of the programs. Prerequisite: ENVS 112 or BIOL 112 or equivalent or permission of instructor. Offered each semester.

### ENVS 253 SUSTAINABLE AGRICULTURE

Credit: 0.5

The purpose of the course is to introduce students to the principles of sustainable agriculture through hands-on experience on local farms and through readings of current literature. The course thus combines fieldwork and seminar-style discussion. Work on the farm will be varied, determined by the seasons and farm projects under way. In addition, students may be taken to the local Producers Livestock Auction and other off-farm sites as the time and season allow. Students can expect to handle and feed animals, clean barns, harvest and plant crops, prepare farm products for market, build and repair fences, bale hay, and work with, repair or clean equipment and buildings. Readings will be drawn from relevant books, current environmental literature and the news media. Discussions will be student-led and combine readings and their experiences in the field. Completion of ENVS 112 is strongly encouraged. Also, students must have available in their academic schedule four continuous hours one day per week to spend working at a local organic farm (travel time will be in addition to these four hours). In addition, students will participate in a weekly seminar discussion of assigned readings, lasting from an hour and a half to two hours. Participation is limited to eight to 10 students and permission of instructor is required. Preference will be given to juniors and seniors. No prerequisite. Offered every fall.

Instructor: Staff

### ENVS 261 GEOGRAPHIC INFORMATION SCIENCE

Credit: 0.5

This course is for all students interested in improving their spatial literacy, or the ability to use spatial information to communicate, reason, and solve problems - in this case environmental problems, nearly all of which have a spatial component. Following a review of maps (coordinate and projection systems, cartographic principles, etc.) we will survey a number of online mapping applications (e.g., Google Earth) and use these to produce informative maps. We also will explore the nature of the Global Positioning System (GPS) and how data can be collected in the field for future analysis and presentation. The focus of the course will eventually settle onto the nature of computer-based geographic information systems (GIS) and the ways in which this powerful suite of tools can be used to analyze geographic data, model spatial processes and make informed decisions. Lectures will introduce fundamental concepts such as scale and resolution, the nature and structure of spatial data models, and the construction of GIS queries. A series of laboratory case studies will present real-world applications of GIS while offering students opportunities to apply the fundamental concepts discussed in lectures. Prerequisite: sophomore standing.

Instructor: E. Holdener

### ENVS 461 SEMINAR IN ENVIRONMENTAL STUDIES

Credit: 0.5

The intention of this capstone seminar is to draw together and apply the concepts learned in earlier courses in the Environmental Studies Concentration. The focus of the course will be on case studies of natural-resource management, with specific topic areas to be determined. In this

strongly interdisciplinary effort, we will explore ecological, economic, social and legal issues that influence how people exploit natural resources, and whether that exploitation is sustainable. Students will be expected to develop and communicate their understanding of the complex and inseparable relationships of human well-being, ecosystem services and environmental management. Prerequisite: junior standing and must be pursuing the Environmental Studies Concentration. Offered every year.

#### ENVS 493 INDIVIDUAL STUDY

Credit: 0.25-0.5

Because the Environmental Studies Concentration has no faculty of its own, the nature of an individual study will necessarily vary dramatically depending on the home discipline of the faculty member guiding the course. Details regarding the expected number of contact hours per week, workload, and assessment will be left to the discretion of the faculty member guiding the individual study. There are no formal restrictions on who can pursue an individual study in environmental studies. Individual studies are not intended to replace an elective course in fulfilling the requirements of the Environmental Studies Concentration.

#### ADDITIONAL COURSES THAT MEET THE REQUIREMENTS FOR THIS CONCENTRATION:

ANTH 111: Introduction to Biological Anthropology

ANTH 320: Anthropology of Food

ANTH 324: Human Ecology: Biocultural Adaptations

ANTH 333: Prehistory of Europe and Western Asia

BIOL 106: Conservation Biology

BIOL 115: Energy in Living Systems

BIOL 228: Ecology

BIOL 229: Ecology Laboratory

BIOL 251: Marine Biology

BIOL 328: Global Ecology and Biogeography

BIOL 352: Aquatic Systems Biology

BIOL 353: Aquatic Systems Lab

CHEM 108: Solar Energy

CHEM 110: Environmental Chemistry

CHEM 121: Introductory Chemistry

CHEM 122: Chemical Principles

CHEM 231: Organic Chemistry I

CHEM 232: Organic Chemistry II

CHEM 341: Instrumental Analysis

ECON 101: Principles of Microeconomics

ECON 336: Environmental Economics

ECON 342: Economics of Regulation

ECON 345: Futures and Options

ECON 347: Economics of the Public Sector

PHIL 110: Introduction to Ethics

PHIL 115: Practical Issues in Ethics

PHYS 108: Geology

PSCI 362: America and the World in the 21st Century

PSCI 363: Global Environmental Politics

PSCI 480: Science and Politics

RLST 481: Religion and Nature

SOCY 233: Sociology of Food