

ENVIRONMENTAL STUDIES

The field of Environmental Studies recognizes that finding solutions to the environmental challenges facing our society requires individuals with experience and training in a broad array of disciplines. Success in the field requires not only a scientific background to develop technical solutions but also an understanding of the social and economic implications of solutions and decisions. The Environmental Studies Program at UNO offers interdisciplinary undergraduate degrees that provide students with training in the breadth of disciplines required to understand the complex nature of solving environmental challenges, as well as the scientific expertise needed to successfully pursue a career relating to the environment.

Other Information

All coursework taken for the Environmental Science major or minor must be completed with a grade of "C-" or better.

Double Counting

ENVN–Geography & Planning and Geography double majors: Students may not count the same 3000-4000 level Geography courses towards both majors, with the exception of GEOG 3530 and 4050.

ENVN–Geography and Planning major with Geography minors: may not use the same 3000/4000 level course for both programs.

ENVN–Earth Sciences major and Geology minors: GEOL 1170 and one 2000-level or higher course may count toward both programs.

ENVN–Earth Sciences major and Geography minors: one upper-level GEOG/GEOL course may count toward both programs.

ENVN–Life Sciences and Biology double majors: With the exceptions of BIOL 1450 (<https://catalog.unomaha.edu/search/?P=BIOL%201450>), BIOL 1750 (<https://catalog.unomaha.edu/search/?P=BIOL%201750>), BIOL 2140 (<https://catalog.unomaha.edu/search/?P=BIOL%202140>), and BIOL (<https://catalog.unomaha.edu/search/?P=BIOL%203020>)3340, no other biology courses may count for both majors.

BS/BA Geology major with ENVN minor: no 3000/4000 level courses may overlap.

Fast Track Program (for students seeking the BS in Environmental Science with a concentration in Geography and Planning)

The Department of Geography/Geology has developed a Fast Track program for highly qualified and motivated students providing the opportunity to complete a bachelor's degree and a master's degree in an accelerated time frame. With Fast Track, students may count up to 9 graduate hours toward the completion of their undergraduate program as well as the graduate degree program.

Program Specifics:

- This program is available for undergraduate students pursuing a BS in Environmental Science (Geography & Planning Option) desiring to pursue an MS in Geography.
- Students must have completed no less than 60 undergraduate hours.
- Students must have a minimum undergraduate GPA of 3.0.

- Students must have a graduate faculty member in the department of Geography/Geology provide a short letter of support for their application to Fast Track as a faculty sponsor/mentor.
- Students must complete the Fast Track Approval form and obtain all signatures and submit to the Office of Graduate Studies prior to first enrollment in a graduate course.
- Students will work with their undergraduate advisor to register for the graduate courses
- A minimum cumulative GPA of 3.0 for graduate coursework is required to remain in good standing.
- Students remain undergraduates until they meet all the requirements for the undergraduate degree and are eligible for all rights and privileges granted undergraduate status including financial aid.
- Near the end of the undergraduate program, formal application to the graduate program is required. The application fee will be waived; the applicant will need to contact the Office of Graduate Studies for a fee waiver code.
 - Admission to Fast Track does NOT guarantee admission to the graduate program.
 - The admit term must be after the completion term of the undergraduate degree.

Contact

Dr. David Manning, Director
114 Allwine Hall
davidmanning@unomaha.edu

Website (<http://www.unomaha.edu/college-of-arts-and-sciences/environmental-studies/>)

Degrees Offered

- Environmental Science, Bachelor of Science with a Concentration in Analytical Sciences (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/environmental-studies/environmental-sciences-environmental-studies-bs-analytical-sciences-concentration/>)
- Environmental Science, Bachelor of Science with a Concentration in Earth Sciences (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/environmental-studies/environmental-sciences-environmental-studies-bs-earth-sciences-concentration/>)
- Environmental Science, Bachelor of Science with a Concentration in Geography and Planning (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/environmental-studies/environmental-sciences-environmental-studies-bs-geography-and-planning-concentration/>)
- Environmental Science, Bachelor of Science with a Concentration in Life Sciences (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/environmental-studies/environmental-sciences-environmental-studies-bs-life-sciences-concentration/>)

Writing in the Discipline

All environmental science majors must fill the Writing in the Discipline (WID) requirement. For each concentration, students can meet the requirement accordingly:

- Analytical Sciences concentration: ENGL 3980 or another advisor-approved course.
- Earth Sciences concentration: GEOL 4950 or ENGL 3980 or another advisor-approved course.
- Geography and Planning concentration: ENGL 3980 or another advisor-approved course.
- Life Sciences concentration: To satisfy the requirement for the writing in the discipline course students must complete BIOL 1450 and BIOL 1750, two courses

from BIOL 2140, BIOL 3020 and BIOL 3340 and two additional 3000-4000 level courses that are approved as meeting the writing requirement by the Department of Biology. Only courses taken at UNO and after January 1, 2010 can be applied to this requirement. Students not meeting the writing requirement through this sequence of courses will fulfill the writing requirement by completing BIOL 3150, ENGL 3980, or another advisor-approved course.

Hour Requirements

To obtain a BS in Environmental Sciences, a student must fulfill university, college, and departmental requirements. As a comprehensive major, Environmental Sciences meets the college breadth requirement without the addition of a minor or additional General Education courses. Other hour requirements follow:

- 46 hours of University General Education courses - Environmental Sciences majors who work with their advisor to select courses do not complete 46 hours of coursework solely for the purpose of meeting university General Education requirements. Instead, they select courses to ensure that they:
 - Take six hours of coursework that meets both the six hours of diversity requirements and six hours of distribution requirements,
 - Meet the three-hour University General Education mathematics requirement through completing statistics as part of their major courses,
 - Meet the seven-hour University General Education natural sciences distribution requirement through completing major courses.
 By doing so, the number of credit hours taken solely to meet General Education requirements is reduced to 30 or fewer.
- Minimum of 69-80 hours of major courses depending on the concentration selected.
- 10 - 21 hours of electives. Total elective credit is determined by the General Education courses taken, concentration selected, and the selection of courses used to fulfill major requirements.

TOTAL HOURS: 120

Core Requirements

All majors complete a set of core courses in the environmental sciences, in addition to completing courses specific to their concentration. Core requirements include:

Code	Title	Credits
ENVN 2010	ENVIRONMENTAL PROBLEMS AND SOLUTIONS	2
Two additional approved introductory environmental science courses		6-7
ENVN/GEOL/BIOL 4610	ENVIRONMENTAL MONITORING AND ASSESSMENT	3
A minimum of 1 credit hour in ENVN 4800 (up to 3 credits can be applied to the major)		
ENVN/BIOL 4800	INTERNSHIP IN ENVIRONMENTAL MANAGEMENT AND PLANNING	1-3
ENVN/GEOG 4820	INTRODUCTION TO ENVIRONMENTAL LAW & REGULATIONS	3
An approved course in statistics		3-4
An approved GIS course		1-4
An approved course focusing on the human dimensions of environmental studies		3
Total Credits		22-29

Minors Offered

- Environmental Science Minor (<http://catalog.unomaha.edu/undergraduate/college-arts-sciences/environmental-studies/environmental-sciences-minor/>)

The Environmental Studies Program at UNO offers interdisciplinary undergraduate degrees that provide students with training in the breadth of disciplines required to understand the complex nature of solving environmental challenges. Students acquire the scientific expertise to effectively pursue a career relating to the environment by focusing on one of four areas of concentration. The Environmental Studies Program is committed to preparing students for careers helping to meet the environmental challenges facing us locally, nationally and globally.

Environmental Science – Analytical Sciences concentration

The analytical sciences concentration is designed to produce environmental scientists with a strong background in chemistry preparing them to find solutions to problems associated with chemical pollutants that are being released into the air, earth and water environments of our planet.

Environmental Science – Earth Sciences concentration

The earth sciences concentration is designed to prepare students for a career in environmental geology, working on land, soil, and water conservation.

Environmental Science – Geography and Planning concentration

The geography and planning concentration is designed to produce local and regional planning specialists who understand the best approaches for preventing environmental problems.

Environmental Science – Life Sciences concentration

The life sciences concentration is designed to prepare a student for jobs as environmental biologists protecting natural ecosystems and promoting a healthy environment.

Some career options

- Air and Water quality scientist
- City and Regional Planning aide
- Conservation Biologist
- Environmental consultant
- Environmental educator
- Natural Resource Manager
- Environmental and Public Health Specialist
- Geospatial Information Systems technician
- Restoration Ecologist
- Soil and Water Conservationist
- Sustainability Coordinator
- Wildlife & Fisheries Biologist

ENVN 2010 ENVIRONMENTAL PROBLEMS AND SOLUTIONS (2 credits)

An overview of current environmental problems and the efforts to solve those problems. Intended for Environmental Studies majors and other students with an interest in conservation, the human environment, and management of natural resources. This course examines current local, regional, and global environmental issues and explores work being done to improve environmental quality. The purpose of the course is to give students a broad, interdisciplinary overview of environmental topics and to provide introductory, hands-on experience working with tools that are used to solve environmental problems that they will also encounter in advanced coursework. Usually offered every semester.

Prerequisite(s): BIOL 1330 or GEOL 1010 or GEOG 1050 (or concurrent enrollment). Not open to non-degree graduate students.

ENVN 2020 STATISTICS FOR LIFE AND ENVIRONMENTAL SCIENCE (3 credits)

The course will train life and environmental science students in 1) searching and accessing public data repositories to address questions in the area of life and environmental science, 2) carrying out quality control of data files and preparing data files for statistical analysis, 3) summarizing data with tables and graphs for reports using the principles of descriptive statistics, and 4) applying basic principles of inferential statistics to test simple life and environmental science models. The students will also practice 1) using spreadsheet software (e.g., Excel) for basic data organization, clean-up, and manipulation and 2) carrying out basic descriptive and inferential statistics with R (the standard statistical software used in life and environmental science). In addition to using the frequentist approach (null hypothesis testing) for inferential statistics, the course will also emphasize effect sizes, because statistically significant, yet small effects, are generally of minor importance in biological and environmental systems. (Cross-listed with BIOL 2020).

Prerequisite(s): MATH 1120 or MATH 1130 or MATH 1220 or MATH 1300 or MATH 1320 or Permission of Instructor.

ENVN 3030 MICROBIAL ECOLOGY (4 credits)

This course will introduce students to the diversity and ecology of microbes in various environments (soils, water, plants, insects, etc.) through an integrated lecture and laboratory course. Emphasis will be placed on molecular approaches to analyzing microbial diversity and evolution, and teacher-directed but student-led investigations. Students will participate in a continuum of course-based research experiences in molecular microbial ecology, from field work to laboratory techniques, and evolutionary analysis of DNA sequence data. The course explores ecological principles as they apply to microorganisms, while emphasizing the molecular, biochemical and evolutionary diversity in the microbial world. (Cross-listed with BIOL 3030).

ENVN 3180 ENVIRONMENTAL ETHICS (3 credits)

This course introduces students to the thinkers and issues that make environmental ethics what it is today. It includes the analysis and evaluation, from ethical viewpoints, of such topics as: intrinsic value of animals, plants and ecosystems; animal rights; climate change; conservation and preservation; environmental law and politics; obligations to future generations; sustainability and new technologies; war, immigration, and the environment; human rights and the environment; nature and the built environment; and environmental activism. (Cross-listed with PHIL 3180).

Prerequisite(s): Junior or 3 hours of philosophy.

ENVN 3310 SUSTAINABILITY AND THE ENVIRONMENT IN THE SPANISH-SPEAKING WORLD (3 credits)

This course presents a broad, interdisciplinary introduction to some of the most pressing environmental and ecological problems in various parts of the Spanish-speaking world, as well as some of the ways in which such problems are being addressed at different levels to promote social and ecological sustainability (locally, nationally, regionally, and globally). The Spanish-speaking world, also known as the Hispanosphere, encompasses the following geographical areas: Spain, Hispanic America, Equatorial Guinea, and portions of the United States. In addition, the course explores some of the ways in which these topics have been represented through a variety of genres, such as documentaries, fiction films, comics, narrative texts, poetry, and essays. Finally, the course also focuses on the continued development of Spanish language skills, such as the acquisition of specialized vocabulary, formal and informal essay writing, presentational speaking skills, advanced reading, and the analysis of film and other media. (Cross-listed with SPAN 3310).

Prerequisite(s): SPAN 3030 or SPAN 3010, SPAN 3040 or SPAN 3020, and SPAN 3060.

ENVN 4090 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES (3 credits)

A lecture and/or laboratory course pertaining to a specific topic in environmental studies or sustainability not available in the regular curriculum. May be repeated as topics change.

Prerequisite(s): Junior or senior standing.

ENVN 4180 FRESHWATER ECOLOGY (4 credits)

A study of the physical, chemical and biological relationships that serve to establish and maintain plant and animal communities in freshwater environments. (Cross-listed with BIOL 8186, BIOL 4180).

Prerequisite(s): BIOL 1450 and BIOL 1750, junior-senior, or permission of instructor. Must enroll in lab. Not open to non-degree graduate students.

ENVN 4270 GLOBAL ENVIRONMENTAL POLITICS (3 credits)

This course introduces students to issues of global environmental politics and policy, including the science behind issues such as climate change, how environmental policy is made at the national and international levels, and what role politics plays in determining environmental resource use. (Cross-listed with PSCI 4270, PSCI 8276)

Prerequisite(s): PSCI 2210 or junior standing or permission of instructor.

ENVN 4310 OUR ENERGY FUTURE: SOCIETY, THE ENVIRONMENT AND SUSTAINABILITY (3 credits)

In this course, students will analyze our energy options including the environmental, economic, and ethical connections with a particular emphasis on electrical energy. The course doesn't prescribe a particular energy future but rather emphasizes development of the knowledge and skills to more effectively contribute to the conversation. To understand our future, the course begins with the present energy landscape and its historical underpinnings, then focuses on developing a student's ability to critically assess energy options by examining the associated implications, consequences, intent, origins, and bias. Students' own work, life, and academic experience are used in the course to underscore the individual relevance of these energy choices. The course includes the necessary science, but the greater emphasis is on the associated critical and creative thinking so that ultimately students can make informed, creative, sustainable energy choices. (Cross-listed with ENVN 8316, CACT 8316)

Prerequisite(s): Permission of instructor.

ENVN 4320 ECOLOGICAL SUSTAINABILITY AND HUMAN HEALTH (3 credits)

The course will explore and develop the complex context of the systemic links among ecosystems and human health (and more broadly human well-being) using case studies including climate change, water quality, infectious diseases and agricultural production. Students will develop skills in critical thinking and applied research by studying biological connections between humans and ecosystems and how social, economic and cultural processes and practices mediate these connections. This course supports the Health and the Environment concentration in the Master of Arts in Critical and Creative Thinking. (Cross-listed with CACT 8326)

Prerequisite(s): Junior or Senior standing

ENVN 4330 INTRODUCTION TO GREEN INFRASTRUCTURE (3 credits)

This course provides an overview of green infrastructure including issues managed with green infrastructure (storm water quality and quantity, urban habitat value, urban sustainability, etc.); basic design and management parameters for best management practices (BMPs); case study applications of BMPs; treatment train assessment and evaluation; and regulatory and cost considerations. (Cross-listed with ENVN 8336).

Prerequisite(s): Junior/Senior standing or instructor permission

ENVN 4350 GLOBAL CLIMATE CHANGE (3 credits)

The primary objective of this course is for students to form a scientific, evidence-based, stance on current and future changes to the Earth's climate. To this end, this course will be based on scientific inquiry into the current state of knowledge. Particular emphases are placed on evidence and causes of change, and the associated environmental and social impacts, including: water resources, extreme weather, human health, and others of interest to the class. (Cross-listed with GEOG 8356, GEOG 4350, ENVN 8356).

Prerequisite(s): At least 1 of the following: GEOG 1030, GEOG 1050, GEOG 3510, GEOG 4320, or permission of instructor

ENVN 4390 THE NATURE OF THE PAST: AMERICAN ENVIRONMENTAL HISTORY, PRE-HISTORY TO THE PRESENT (3 credits)

This course will introduce students to the field of American Environmental History. Students will engage with literature produced by scholars who, broadly speaking, research and write about the many ways in which humans have shaped nature and, conversely, how nature has shaped humans over time. We will focus on the myriad peoples and cultures that have thrived in what is presently the United States and how these peoples have interacted with their physical environments in a multitude of contexts, from the transformation of ecosystems for economic purposes, to the cultural and scientific ideas that have shaped human notions of the natural world, to the ways in which people have mobilized governments to transform the environment. (Cross-listed with HIST 4390, HIST 8196, SUST 4390).

ENVN 4410 WETLAND ECOLOGY AND MANAGEMENT (3 credits)

This course will examine the principles and theory of wetland ecology with application towards wetland management and regulation. An interdisciplinary overview of physical, biological and regulatory aspects of wetlands will allow students to synthesize information from their backgrounds in geography, geology and ecology. Definitions, classifications, natural processes and functions of wetland environments will be presented. Labs concentrate on field techniques used to assess specific plant, animal, soil, and hydrological characteristics of wetlands. (Cross-listed with BIOL 4410 and BIOL 8416)

Prerequisite(s): BIOL 3340 or instructor permission.

ENVN 4420 RESTORATION ECOLOGY (3 credits)

Restoration Ecology examines how people assist with the recovery of ecosystems that have been degraded. The course will examine the theory and application of restoration ecology through lecture, discussion, field trips, and development of a restoration management plan for a degraded ecosystem near Omaha. The course will provide information and resources used by restoration and land management professionals to plan, implement, and manage restorations. (Cross-listed with BIOL 4420, BIOL 8426)

Prerequisite(s): Junior or Senior standing.

ENVN 4600 GIS APPLICATIONS FOR ENVIRONMENTAL SCIENCE (1 credit)

This course introduces the use of geographic information systems (GIS) and other geospatial tools for work in the fields of environmental science, ecology, and natural resource management. The course will develop a working knowledge of the common software and hardware tools used by ecologists through hands-on projects. (Cross-listed with BIOL 4600, BIOL 8606)

Prerequisite(s): BIOL 3340 or permission of instructor.

ENVN 4610 ENVIRONMENTAL MONITORING AND ASSESSMENT (3 credits)

An interdisciplinary approach to techniques for the design and implementation of environmental inventory and monitoring schemes used to evaluate natural resources. Students work as teams to synthesize information from their backgrounds in geography, geology and ecology to evaluate the impacts of human actions on environmental quality following the framework for environmental assessments provided by the National Environmental Policy Act. Course is organized to accommodate variable needs of students with different backgrounds and career choices. Usually offered every year. (Cross-listed with BIOL 4610, GEOG 4610, GEOG 8616, GEOL 4610, GEOL 8616)

Prerequisite(s): Permission of instructor.

ENVN 4700 SUSTAINABLE SOLUTIONS CAPSTONE (3 credits)

This is a capstone experience for students interested in sustainability and related fields. Students work as part of a multidisciplinary team under the guidance of faculty mentors to develop sustainable solutions to challenges faced by local, regional, or global organizations.

Prerequisite(s): Instructor permission.

ENVN 4800 INTERNSHIP IN ENVIRONMENTAL MANAGEMENT AND PLANNING (1-3 credits)

Internship providing practical experience working with environmental organizations or government agencies for students interested in careers in environmental science and related fields. A proposed internship must be approved by the Environmental Studies Program prior to enrolling. Usually offered Fall, Spring, Summer. (Cross-listed with BIOL 4800)

Prerequisite(s): Permission of the Environmental Studies Program.

ENVN 4820 INTRODUCTION TO ENVIRONMENTAL LAW & REGULATIONS (3 credits)

An introduction to environmental law and regulations intended for students pursuing careers in environmental sciences or related fields. The course emphasizes the origins, implementation, and enforcement of U.S. state and federal laws and regulations. Major federal environmental laws, covering air and water quality, solid and hazardous waste, pollution prevention and remediation, and natural resources will be discussed. Usually offered Fall semesters. (Cross-listed with ENVN 8826, BIOL 4820, GEOG 4820, GEOG 8826, PA 8826)

Prerequisite(s): Junior-senior or permission of the instructor.

ENVN 4970 ADVANCED BOTANY (4 credits)

Advanced Botany examines plant structures (cells, tissues, and organs) and their connections with plant functions (growth, reproduction, photosynthesis, respiration, and dispersal). Topics covered include energy metabolism, development and morphogenesis, genetics, ecology, and the latest in plant taxonomy and phylogeny, keeping students on the forefront of cutting-edge botanical research. In lab, students conduct activities such as dissecting plant organs, making microscope slides, and conducting plant-based experiments, using plants from the local area, from native Great Plains collections, and from around the world and grown in the greenhouse. Students compare and contrast both physiological and morphological adaptations to varying environments. (Cross-listed with BIOL 8976, BIOL 4970).

Prerequisite(s): BIOL 1750 and junior or senior student status or above or instructor permission.