Environmental Sciences

Chair, Department of Earth and Environmental Sciences
- David W. Peate

Coordinators, Environmental Sciences
- Emily Finzel, Andrew A. Forbes

Undergraduate major: environmental sciences (B.A., B.S.)
Undergraduate minor: environmental sciences
Faculty: https://clas.uiowa.edu/envsci/people
Website: https://clas.uiowa.edu/envsci/

The Environmental Sciences Program provides rigorous interdisciplinary training in the scientific study of the environment. It promotes an understanding of the earth as a complex network of interacting organic and inorganic systems. The program's undergraduate curricula reflect the diversity in the broad field of environmental sciences and draw upon the College of Liberal Arts and Sciences' disciplinary strengths, giving students the opportunity to develop particular areas of expertise.

Hands-on field experience is a crucial component of the program. Students are strongly encouraged to engage in research and study abroad.

The Department of Earth and Environmental Sciences is the administrative home for the Environmental Sciences Program.

Courses

Environmental Sciences Courses

ENVS:1080 Introduction to Environmental Science 3-4 s.h.
Biological and physical character of the Earth; interaction of humans with the environment, including impacts on ecosystems, climate, natural processes, resources; alternative options, including sustainability, waste management, energy, land reform. GE: Natural Sciences with Lab; Natural Sciences without Lab. Same as EES:1080.

ENVS:1081 Introduction to Environmental Sciences Laboratory 1 s.h.
Laboratory component of EES:1080. Requirements: completion of 3 s.h. in EES:1080 or ENVS:1080; or 3 s.h. of transfer equivalent. GE: Natural Sciences Lab only. Same as EES:1081.

ENVS:1085 Fundamentals of Environmental Science 4 s.h.
Interdisciplinary study of how Earth's natural systems interact, how these systems affect society, and how they respond to human activity; how environmental problems can be solved and avoided by drawing upon knowledge in disciplines as diverse as ecology, anthropology, economics, chemistry, and political science; blended instructional environment, including traditional lectures, discussions in TILE classrooms, laboratory, online learning, peer-reviewed writing exercises, and service learning. Offered fall semesters. GE: Natural Sciences with Lab. Same as EES:1085.

ENVS:1115 The History and Science of Oil 3 s.h.
Historical perspective on business, science, geology, technology, politics, environment, and culture of the global oil industry; the rise of oil as the most influential international business of the last 150 years, the material foundation of economies, a major force in world politics, a shaper of daily life, and a guide to understanding Earth's deep history. Offered fall semesters. GE: Historical Perspectives. Same as EES:1115, GEOG:1115, HIST:1115.

ENVS:2001 Second-Year Field Trip for Earth and Environmental Sciences 1 s.h.
Opportunity for students to begin developing an appreciation of earth system and earth history scales; application of classroom learning to field-based inquiry; real-world examples of introductory course material in an outdoor classroom setting. Prerequisites: EES:1030 or EES:1050 or EES:1080 or ENVS:1080. Requirements: geoscience or environmental sciences major. Same as EES:2001.

ENVS:2010 Interdisciplinary Environmental Seminar 1 s.h.

ENVS:2200 Historical Geology 4 s.h.
Framework of earth history that is essential to understand how the earth system works; investigation of physical, biological, atmospheric, oceanographic, and chemical history of the earth to prepare for further earth and environmental science courses. Prerequisites: EES:1030 or EES:1050 or EES:1080 or ENVS:1080 or ENVS:1085 or ENVS:1085. Same as EES:2200.
ENVS:2673 Ecology 3 s.h.
Adaptations of organisms to their physical and biological
environments; organism-environment interactions;
population biology; interactions between species; ecology
of communities, ecosystems; human impact on ecosystems.
Prerequisites: BIOL:1411 and BIOL:1412. Recommendations: a
basic statistics or calculus course. Same as BIOL:2673.

ENVS:3001 Third-Year Field Trip for Earth and
Environmental Sciences 1 s.h.
Opportunity for students to apply their major coursework to
real-world problems; field trip to visit parks, mines, and/or
quarries in Missouri and Arkansas that illustrate many of the
lessons learned in EES:2410 and EES:3500. Prerequisites:
EES:1030 or EES:1050 or EES:1080 or ENVS:1080 or
EES:2410. Requirements: geoscience or environmental
sciences major, and junior standing. Same as EES:3001.

ENVS:3010 Interdisciplinary Environmental
Seminar 1 s.h.
Role of sciences in environmental issues and problems;
progression from observation to evaluation to design of better
questions and experiments. Requirements: third- or fourth-
year standing. Same as EES:3010, GEOG:3003.

ENVS:3020 Earth Surface Processes 3 s.h.
Basic geomorphic and environmental processes that shape
the earth's surface; emphasis on erosion, transport, deposition
by land mass movement (creep, landslides, earth flow),
fluid agents (wind, water, ice); methods used to study these
processes. Recommendations: EES:1050 or EES:1080 or
ENVS:1080 or GEOG:1020 or EES:1085 or ENVS:1085.
Same as EES:3020, GEOG:3020.

ENVS:3030 Conservation Paleobiology 4 s.h.
Exploration of how near- and deep-time geologic record
pertains to conservation; restoration targets; best practices
for conservation of ecosystems; human impacts. Same as
EES:3030.

ENVS:3050 Geology of Iowa 2 s.h.
Exploration of geologic history responsible for landscape,
soil, rocks, fossils, water, and natural resources of Iowa;
background of Iowa's natural history; preparation for K-12
educators to deliver earth and environmental science content
in their own classrooms, utilizing natural landscapes in Iowa.
Same as EES:3050.

ENVS:3051 Geology of Iowa Field Trip 1 s.h.
Exploration of the geologic history responsible for landscape,
soil, rocks, fossils, water, and natural resources of Iowa; field-
based examples of Iowa's natural history; preparation for K-12
educators to deliver earth and environmental science content
in their own classrooms utilizing the natural landscapes in

ENVS:3095 Field Ecology 4 s.h.
Analysis and interpretation of patterns and underlying
physical and biotic basis for regional and local distributions
of plants and animals of eastern Iowa; field observation,
sampling, and laboratory analysis; conduction of several field
research projects requiring collection, statistical analysis, and
interpretation of data in short reports; field-oriented course.
Recommendations: advanced undergraduate standing or
graduate standing in ecology, environmental sciences, or
geoscience.

ENVS:3096 Winter Ecology 2 s.h.
How seasons occur, thermoregulation, microhabitats, what
animals are active, and winter plant identification; local area
fieldwork.

ENVS:3097 Introduction to Bird Study 2 s.h.
Basic identification skills, bird banding, and bird ecology;
Hageboeck Hall of Birds at the UI Museum of Natural History;
local field study.

ENVS:3100 Introduction to Applied Remote
Sensing 4 s.h.
Remote sensing of the earth's surface from aircraft, satellites;
aerial photograph interpretation; remote sensing systems,
methods, data analysis using electromagnetic spectrum and
digital processing techniques, including visible, infrared,
microwave radiation; remote sensing applied to geologic and
environmental problems. Prerequisites: EES:1030 or EES:1050
or EES:1080 or EES:1085. Same as EES:3100.

ENVS:3110 Chemical Evolution of the Oceans 3 s.h.
Investigation of various physicochemical states oceans
have assumed over the past four billion years of Earth
history; use of isotope geochemistry as a proxy for ancient
ocean conditions; focus on integrated Earth system science,
paleoceanographic and paleoclimate modeling, role of
chemical stratigraphy in deciphering past climate states of
ocean-atmosphere system; relationship between chemical
changes in ocean/atmosphere and biological systems of the
Earth. Same as EES:3110.

ENVS:3230 Special Topics 0-4 s.h.
Contemporary issues in environmental science.

ENVS:4001 Fourth-Year Field Trip for Earth and
Environmental Sciences 2 s.h.
Application of core course learning to real-world examples;
students develop a broader understanding of interrelated
aspects of earth and environmental sciences as truly
integrated scientific endeavors; field trip to Big Bend
National Park to highlight a wide range of geoscience and
environmental science studies and provide students an
opportunity to apply all aspects of their training to the
amazing geologic landscape of southwest Texas; capstone
field experience for students heading into their senior year.
Prerequisites: EES:2831. Requirements: geoscience or
environmental sciences major, and senior standing. Same as
EES:4001.

ENVS:4700 Evolution of Ecosystems 3 s.h.
Evolutionary history of terrestrial and marine ecosystems;
ecological processes from population to ecosystem levels;
community assembly, trophic levels, networks, biodiversity
dynamics; practical aspects of paleoecological data collection,
statistical analysis, modeling. Requirements: two courses in
geoscience, biology, environmental sciences, anthropology, or
geography. Same as EES:4700.