

ENVIRONMENTAL SCIENCE/STUDIES (ENV)

ENV SCE Senior Capstone Experience 2 Credits

Every environmental science and environmental studies major is required to complete a Senior Capstone Experience (SCE). Students enroll in the four-credit SCE course during their final semester, although students must begin work on their SCE during the previous semester. The SCE can take the form of a laboratory or field research project, monograph, or service learning project. Selection of the nature of the SCE is based upon discussion with Environmental Science and Studies faculty, and requires the approval of the department Chair. The SCE is graded pass-honors, pass, or fail for students who meet all deadlines. Students not meeting all deadlines are graded with letter grades, with B+ as the highest possible grade. Grading will be based on joint evaluation of the SCE by Environmental Science and Studies faculty.

Term(s) Offered: All Terms, All Years

ENV 101 Intro to Environmental Studies with Lab 4 Credits

This course is an introduction to the discipline of environmental studies. A multidisciplinary view of human responsibility toward the natural world is emphasized, focusing on significant contemporary environmental issues. Topics covered include environmental literature (both historical and current), economic and ethical environmental concerns, scientific methods of assessment and analysis of environmental problems, and possible solutions to representative environmental problems. The laboratory/recitation section is used for field trips, data collection, demonstrations, and discussions. This course is a prerequisite for all upper-level ENV courses. The course should be completed by the end of the sophomore year if it is going to be counted toward the major.

Term(s) Offered: Fall, All Years

Fees: \$25 Lab Fee

ENV 102 Intro to Environmental Studies Lab 0 Credits

This is the lab for the Introduction to Environmental Studies lecture (ENV 101). The lab occurs both inside the lab and outside in the field and consists of field trips, data collection, data analysis, and discussions.

ENV 107 Intro to Environmental Archaeology 4 Credits

Exploration of the variety of past human societies and cultures through archaeology, with an emphasis upon the interplay between environment and culture. The course covers a wide time span, from the biological evolution of hominids and the origins of culture to the development of complex civilizations and the more recent historical past.

Cross-listed as: ANT 107/ENV 107

Term(s) Offered: All Terms, All Years

ENV 109 Intro to Geographic Information Systems 4 Credits

Geographic Information Systems (GIS) can be found throughout our modern society. Programs such as MapQuest and Google Earth have brought this technology into the lives of many citizens of our world. More advanced software systems such as ArcGIS are being used in academia, business, and government to manage large datasets of spatially linked information and provide the users with powerful analytic tools. The course lectures review the fundamental theories of GIS and also focus on the various organizational and ethical issues that impact the implementation and sustainability of GIS in our society. The lab portion of the course teaches the student how to operate the ArcGIS Desktop software product, ArcGIS Pro. Introduction to GIS is taught as a blended course, which means that online content is used to supplement the course. The online content does not replace the traditional lecture and lab components of the course, but is instead meant to enhance the content, and allow for materials to be available outside of class time. Content is reviewed prior to attending class, which provides time for discussion, clarification, and problem-solving during class time. All course materials along with lab assignments, quizzes, and exams are managed in our innovative Canvas virtual learning environment.

Cross-listed as: ANT 109/ENV 109

Term(s) Offered: Other, Non Conforming

ENV 110 Chemistry of the Environment with Lab 4 Credits

An introductory course focusing on the chemical dimensions of current environmental problems such as global warming, ozone depletion, water and soil contamination, and non-renewable fuel consumption. Fundamental principles of chemical bonding, equilibrium and kinetics are studied as they arise in connection with each environmental issue. Interdisciplinary aspects are explored to further understand the multiple dimensions of the problems. Intended for students planning to major outside the sciences.

Cross-listed as: CHE 110/ENV 110

Term(s) Offered: Fall, All Years

Fees: \$50 Lab Fee

ENV 115 Environmental Education Field Experience 1 Credit

This one-credit fieldwork course consists of a minimum of 20 hours of off-campus supervised experiences with organizations that emphasize the overlap between the environment and education. Students observe, reflect upon, and participate in outreach and education duties at a local park, nature center, outdoor school, or other environmental agency.

Cross-listed as: ENV 115/EDU 115

Term(s) Offered: Fall, All Years

ENV 117 Intro Env & Natural Resource Economics 4 Credits

Environmental and natural resource economics focuses on the economic sources of environmental problems and natural resource use in a market economy and the evaluation of the alternative policies for dealing with these problems. This analysis extends to the examination of regional issues (local air and water pollution, recycling programs, and fisheries) and global issues (climate change and waste disposal). The course is intended for students not planning to major in economics.

Cross-listed as: ENV 117 / ECN 117

Term(s) Offered: Spring, All Years

ENV 137 Culture & Environments of the Chesapeake 4 Credits

An examination of prehistoric and historic societies in the Chesapeake Region. Archaeological, historical, and environmental evidence is used to understand cultural development and the relationships between people and their environment. Topics include the arrival of humans in the region, Native American groups, colonial settlement in the Tidewater, and the 19th Century.

Cross-listed as: ANT 137/ENV 137

Term(s) Offered: Spring, All Years

ENV 140 Exploring the Solid Earth with Lab 4 Credits

This course investigates the composition, structure, and dynamics of the solid Earth. The course reviews prominent theories for the origin of matter, the accretion and differentiation of the planets, and the structure of the Earth's interior. The role of plate tectonics in driving the exchange of matter and energy between Earth systems is a central theme of the course, providing the theoretical context for understanding geological phenomena such as seismic activity, volcanism and mountain building. The course is designed to provide the necessary scientific and intellectual background for understanding a wide range of Earth phenomena, and to give students a greater appreciation for the origin and evolution of their planet.

Term(s) Offered: Other, Non Conforming

Fees: \$25 Lab Fee

ENV 141 Atmosphere, Ocean & Environment w/Lab 4 Credits

This course examines processes and features that characterize the Earth's surface. The course focuses on the major Earth systems of land (lithosphere), air (atmosphere), and water (hydrosphere) and explores how these systems evolve and interact through geologic time. Examples include studying global air circulation and its effect on weather, examining links between ocean currents and global climate, and exploring how stream processes help to shape landscape. The role of plate tectonics in driving the exchange of matter and energy between Earth's systems is also a central theme. The course is designed to provide the necessary scientific and intellectual background for understanding a wide range of Earth phenomena, and to give students a greater appreciation for the natural environment.

Term(s) Offered: Other, Non Conforming

Fees: \$25 Lab Fee

ENV 190 Environmental Studies Internship 1 Credit

Students earn credit for pursuing a full-time internship outside of WC. Students must apply through the WC internship office and find a WC advisor and an on-site advisor. Participants produce a final paper, poster or video detailing the findings of their work. Internships must first be approved by the Chair of the Department. 1 or 2 credits. 45 hours per credit is required.

Term(s) Offered: All Terms, All Years

ENV 194 Special Topics 4 Credits

Topics not regularly offered in a department's normal course offerings, chosen based on current student interest and faculty expertise. Special topic courses can only be offered 3 times; after this, the course must be approved as a regular course. Graded A-F or Pass/Fail.

Term(s) Offered: Other, Non Conforming

ENV 210 Environmental Chemistry with Lab 4 Credits

The cycling of natural chemical species and pollutants in the water, soil and air of our earth system is a major component of our complex ecosystem. In this environmental chemistry course, we develop an understanding of the transport and reactions controlling natural chemical species in our environment, as well as the cycling of pollutants. We focus primarily on current issues of water, soil and air pollution and study how scientists are cleaning up currently polluted sites, such as through bioremediation, and then look forward to how society is working towards reducing the movement of pollutants through our environment. In the laboratory portion of the class, we investigate the water quality of local water bodies, including the Chester River, as well as conduct hands-on experiments to the environmental issues studied in class.

Cross-listed as: CHE 210/ENV 210

Term(s) Offered: Spring, All Years

Fees: \$50 Lab Fee

ENV 211 Intermediate Geographic Info Systems 4 Credits

This second course in geographic information systems builds upon the theories discussed in introduction to Geographic Information Systems, and focuses on the more technical aspects of GIS. Laboratory activities teach the student to use more advanced functions of GIS software, and the fundamentals of advanced GIS analysis and display programs. The student will also learn to operate a precision GPS field data collector.

Term(s) Offered: Fall, Non Conforming

ENV 221 The Bermuda Environment 4 Credits

This summer course investigates the complex marine ecology of the Bermuda Islands, the impact of human habitation and tourism on the natural history, and current environmental concerns and means of mitigating those concerns. Students study the geology of Bermuda, biogeography and colonization, coral reef ecology, sponge and sea grass ecology, culture and history of Bermuda and its major towns, and the environmental impacts of people living on and visiting such a small area of islands.

Cross-listed as: BIO 221/ENV 221

Term(s) Offered: Summer, Odd Years

ENV 222 Summer Env. Studies Ecuador 4 Credits

This three-week-long summer course, offered in conjunction with the Universidad San Francisco de Quito, investigates many of the world's most distinctive species of plants and animals found in the richly diverse ecosystems of Ecuador. Students gain an understanding of Ecuador's social and economic issues and the challenges it faces as a developing country while attempting to conserve its natural resources. Topics investigated include conservation of the Amazon rainforest and oil exploration, ecotourism, biodiversity concerns, mangrove conservation and the fate of Galapagos tortoises and the Galapagos fisheries.

Term(s) Offered: Summer, Even Years

ENV 240 Earth and Planetary Systems with Lab 4 Credits

This course features a detailed examination of the unique interaction between the Earth's geosphere, biosphere, hydrosphere and atmosphere, and how these systems contrast with those of the other planets in the solar system. The course includes a lecture and an integrated lab component. The lecture discussion and reading emphasizes the history of Earth systems, from the birth of the solar system and differentiation of the Earth, to the emergence of biological life, chemical evolution of the modern atmosphere, and the changes to the Earth's climate, ocean and lithosphere throughout geologic history. The lab introduces students to important tools in Earth Science research, including radiometric dating, chemical studies of natural materials, remote sensing and data base analysis. The course provides advanced students with the necessary scientific and intellectual background for pursuing further studies in Earth and planetary science, geography, and environmental studies.

Cross-listed as: PHY 240/ENV 240

Term(s) Offered: Other, Non Conforming

ENV 241 Environmental Art 4 Credits

This seminar course introduces students to the basic concepts of environmental art through a series of environmental art projects made both inside and outside, in the field. The curriculum centers on deepening student awareness of how a range of materials, spaces, and approaches can be used to make environmental art projects. The course explores both individual and collaborative strategies. Students engage in creative work and basic environmental research, supported by related class discussions and critiques. Readings and screenings about environmentally engaged artists coincide with creative projects.

Cross-listed as: ART 241/ENV 241

Term(s) Offered: Other, Non Conforming

ENV 242 Applied Ecology 4 Credits

This required course gives students an opportunity to study ecological patterns and processes as they relate to human impacts on the environment. Through engaging in experimental and field data collection, in addition to using existing data sets from ecosystems around the world, students in this course explore the impact of human-induced environmental changes (e.g., climate change, chemical spills, trash disposal, agricultural and road runoff, energy production) on basic ecological interactions. By applying the foundational concepts of ecology to our anthropocentric landscapes, students will be able to critically analyze current management strategies while developing novel approaches to ecological challenges.

Term(s) Offered: Fall, All Years

Fees: \$50 Lab Fee

ENV 244 Environmental Communication 4 Credits

Environmental communication is a powerful tool to convey important environmental topics to diverse audiences. In many environmental careers, a central skill will be communicating about complex topics, such as climate change, biodiversity conservation, urban sprawl, and many others. In this project-based course, students practice communicating in many forms (through writing, speaking, creative visual displays, etc.) about environmental topics of their choosing.

Term(s) Offered: Spring, Odd Years

ENV 290 Environmental Studies Internship 1 Credit

Students earn credit for pursuing a full-time internship outside of WC. Students must apply through the WC internship office and find a WC advisor and an on-site advisor. Participants produce a final paper, poster or video detailing the findings of their work. Internships must first be approved by the Chair of the Department. 1 or 2 credits. 45 hours per credit is required.

Term(s) Offered: All Terms, All Years

ENV 294 Special Topics 4 Credits

Topics not regularly offered in a department's normal course offerings, chosen based on current student interest and faculty expertise. Special topic courses can only be offered 3 times; after this, the course must be approved as a regular course. Graded A-F or Pass/Fail.

Term(s) Offered: Other, Non Conforming

ENV 302 Conservation & Wildlife Techniques 4 Credits

Lecture examine patterns in local and global biological diversity and current causes for biodiversity loss. Conservation strategies from the genetic to ecosystem scale are evaluated to inform students about tools scientists can use to prevent species loss and restore natural wildlife habitats and populations. Laboratory exercises allow students to gain familiarity with hands-on techniques for monitoring wildlife populations and include field trips that focus on local conservation efforts. ENV/ESI Majors must have taken ENV 101.

Term(s) Offered: Other, Non Conforming

Fees: \$50 Lab Fee

ENV 303 Environmental Ethics 4 Credits

A study of the nature and history of the environmental movement and our ethical responsibilities with regard to such current issues as the preservation of species, animal rights, the value of ecosystems, ozone depletion, and deep or radical ecology.

Cross-listed as: PHL 303/ENV 303

Term(s) Offered: Other, Non Conforming

ENV 305 Marine Conservation 4 Credits

Marine ecosystems are experiencing unprecedented rates of change caused by human activities. Humans rely on marine ecosystems for life-supporting services (e.g., oxygen, food) as well as income, shoreline protection, recreation, and inspiration. Conserving marine systems requires understanding the threats and what is unique about the marine environment (physically, biologically, chemically) and applying that knowledge to conservation action. This course is grounded in marine ecology but also discusses key ideas and concepts from economics, history, philosophy, and other disciplines as they relate to marine conservation science.

Term(s) Offered: Other, Non Conforming

ENV 311 Field Methods in Environmental Science 4 Credits

Students learn to be environmental field researchers through two collaborative projects conducted throughout the semester. For these collaborative projects, students begin with a literature review and then ask questions, form hypotheses, establish an experimental design, execute the design, analyze the data, and communicate the findings through writing. Other environmental research methods are demonstrated through lab activities including groundwater, river, and stream sampling.

Term(s) Offered: Fall, All Years

Fees: \$50 Lab Fee

ENV 312 Watershed Biogeochemistry 4 Credits

The study of physical, chemical, biological, and geological processes and reactions that govern the composition of and changes to Earth. Students examine water, carbon, nitrogen, phosphorus, and sulfur cycles and discuss how humans have impacted these cycles. The class explores potential management solutions related to anthropogenic disruptions of biogeochemical cycles. The laboratory component involves biogeochemical field, sampling and laboratory analysis techniques.

Term(s) Offered: Spring, All Years

Fees: \$50 Lab Fee

ENV 313 Wetlands Ecology w/ Lab 4 Credits

This course provides an in-depth examination of the function and types of wetlands with an emphasis on ecosystem services, biodiversity and conservation. Lectures include a broad overview of the role wetlands play in larger ecosystems as well as the hydrology, geology, chemistry, trophic interactions and species common to these unique aquatic systems. Laboratories include a large field-based component where students learn to identify wetlands and their associated flora and fauna.

Cross-listed as: BIO 313/ENV 313

Term(s) Offered: Other, Non Conforming

ENV 314 Energy and the Environment 4 Credits

This course explores general topics of energy generation, distribution, and use, as well as the many ways that the energy industry affects the environment. Topics include fossil fuels, heat engines, renewable energy sources, global effects of energy use, politics and energy policy, nuclear energy, and energy conservation.

Term(s) Offered: Other, Non Conforming

ENV 315 Restoration Ecology 4 Credits

This course provides a broad overview of restoration ecology with a focus on local ecosystems. Although people have been actively restoring ecosystems for hundreds of years, the scientific field of restoration ecology is relatively new. It is an interdisciplinary endeavor that seeks to use ecological theories and methods to help ecosystems recover their structure and functions after disturbance, degradation, or total destruction and to help assess the effectiveness of restoration techniques. This course is composed of a variety of different learning approaches including lectures, site field trips, labs, paper discussions, and hands-on restoration projects.

Term(s) Offered: Other, Non Conforming

ENV 317 Environmental Economics 4 Credits

This course is a survey of the application of economic analysis to environmental problems. Analysis will focus on: policy options available to lawmakers and citizens, methods for assigning value to the environment, and air and water pollution and the laws meant to control these problems.

Cross-listed as: ECN 317/ENV 317

Term(s) Offered: Fall, All Years

ENV 318 Natural Resource Economics 4 Credits

This course surveys the economic theory behind, and the management of, renewable and non-renewable resources including fisheries, minerals, timber, water, and biodiversity. Analysis of management options is at the local, regional, and national levels. Analysis includes trade-offs of policies and the effect of property rights on resource use.

Cross-listed as: ECN 318/ENV 318

Term(s) Offered: Other, Non Conforming

ENV 319 Sustainability & the Environment 4 Credits

This class examines the science of how we can interact sustainably with our environment. Discussion topics for this class include waste, green living, green buildings, agriculture, and water acquisition, as well as other topics. The laboratory component of this class focuses on discussion and field trips to explore local sustainability practices.

Term(s) Offered: Other, Non Conforming

ENV 320 Climate Change 4 Credits

This class teaches students the basic science behind climate change. Students evaluate the evidence that our climate is changing and that it is caused by humans. We also discuss our future in a changing climate and potential adaptation, mitigation, and geoengineering strategies. Climate change science is changing quickly, and we will read and discuss recent papers published in the literature. The lab instruction includes field trips, data analysis, and journal article discussion.

Term(s) Offered: Other, Non Conforming

ENV 335 Global Environmental Politics 4 Credits

This course explores environmental issues in a global context, with particular attention paid to international cooperation, international law, and the roles of governments, institutions, NGOs and social movements. The course also focuses on the impact of environmental problems and cooperation on countries in the Global South/North.

Cross-listed as: ENV 335/POL 370

Term(s) Offered: Spring, Non Conforming

ENV 347 American Environmental Writing 4 Credits

The study of writing from an environmental perspective is both an emerging field in literary criticism and a rich tradition in American literary history. What does it mean to be green from a literary point of view? This course explores that question in looking at classic and contemporary authors of American environmental writing, from Henry David Thoreau to Annie Dillard to recent examples of eco-criticism. Though the primary focus is on nonfiction prose, the traditional home of nature writing, the course also explores environmental perspectives in poetry, fiction, and film as well as cross-disciplinary connections with the natural sciences and social sciences.

Cross-listed as: ENG 347/AMS 347/ENV 347

Term(s) Offered: Fall, All Years

ENV 370 Environmental Sociology 4 Credits

This class explores the human dimension of ecosystem science. We use environmental sociology as a framework for understanding the dynamic relationship between humans and the environment, trends in environmental policy and public opinion, environmentalism as a social movement, human-induced environmental decline, and environmental justice. Students explore how changes in ecosystems influence the achievability and sustainability of societal values such as security from natural disasters, health, good social relations, and freedom to pursue personal and cultural interests.

Cross-listed as: SOC 370/ENV 370

Term(s) Offered: Spring, Even Years

ENV 390 Environmental Studies Internship 1 Credit

Students earn credit for pursuing a full-time internship outside of WC. Students must apply through the WC internship office and find a WC advisor and an on-site advisor. Participants produce a final paper, poster or video detailing the findings of their work. Internships must first be approved by the Chair of the Department. 1 or 2 credits. 45 hours per credit is required.

Term(s) Offered: All Terms, All Years

ENV 392 Environmental Studies Junior Seminar 1 Credit

A two-semester weekly seminar that prepares students for graduate education, career development, and writing a successful Senior Capstone Experience (SCE). Seminars are led by Environmental Science and Studies faculty and invited guests. Students present their SCE proposals and findings as part of the seminar. Required of all Environmental Science and Studies majors.

Term(s) Offered: Spring, All Years

ENV 394 Special Topics 4 Credits

Topics not regularly offered in a department's normal course offerings, chosen based on current student interest and faculty expertise. Special topic courses can only be offered 3 times; after this, the course must be approved as a regular course. Graded A-F or Pass/Fail.

Term(s) Offered: Other, Non Conforming

ENV 397 Independent Study 4 Credits

An individualized research project chosen by the student in consultation with a faculty member designed to be the equivalent of a semester-long course. The student, with the help of the faculty mentor, designs a project to be implemented during the semester. Students conduct an appropriate literature search, carry out the research, and submit a written report.

Term(s) Offered: All Terms, All Years

ENV 490 Environmental Studies Internship 1 Credit

Students earn credit for pursuing a full-time internship outside of WC. Students must apply through the WC internship office and find a WC advisor and an on-site advisor. Participants produce a final paper, poster or video detailing the findings of their work. Internships must first be approved by the Chair of the Department. 1 or 2 credits. 45 hours per credit is required.

Term(s) Offered: All Terms, All Years

ENV 491 Environmental Studies Senior Seminar I 1 Credit

A two-semester weekly seminar that prepares students for graduate education, career development, and writing a successful Senior Capstone Experience (SCE). Seminars are led by Environmental Science and Studies faculty and invited guests. Students present their SCE proposals and findings as part of the seminar. Required of all Environmental Science and Studies majors.

Term(s) Offered: Fall, All Years

ENV 494 Special Topics 4 Credits

Topics not regularly offered in a department's normal course offerings, chosen based on current student interest and faculty expertise. Special topic courses can only be offered 3 times; after this, the course must be approved as a regular course. Graded A-F or Pass/Fail.

Term(s) Offered: Other, Non Conforming

ENV 497 Independent Study 4 Credits

An individualized research project chosen by the student in consultation with a faculty member designed to be the equivalent of a semester-long course. The student, with the help of the faculty mentor, designs a project to be implemented during the semester. Students conduct an appropriate literature search, carry out the research, and submit a written report.

Term(s) Offered: All Terms, All Years