

ENVIRONMENTAL STUDIES COURSE DESCRIPTIONS

ES 112: ENVIRONMENTAL ANALYSIS (4)

Also listed and described as CHEM 112. Prerequisite: one to two years of high school chemistry.

ES 117: ENVIRONMENTAL SCIENCE (4)

The lecture/laboratory course explores how organisms, communities, and ecosystems function under natural conditions, as well as under human influence. Discussions and hands-on laboratory work cover a variety of current topics, including dynamics of population growth, patterns of extinction, global warming, acid rain, water pollution, solid waste management, sustainable agriculture, and renewable energy. Also listed as BIOL 117. Open to first-year students. No prerequisite.

ES 121: INTRODUCTION TO OCEANOGRAPHY/HYDROGEOLOGY (4)

Also listed and described as PHYS 121. Open to first-year students.

ES 137: ENVIRONMENTAL PHYSICS (4)

Noncalculus-based general physics that supports the B.S. degree in Environmental Science. This course covers thermal physics of living systems, thermal and fluid physics of the atmosphere, and electromagnetic theory of light, radioactivity, and electrical power generation and transmission. Prerequisite: MATH 140. Also listed as PHYS 137. Open to first-year students.

ES 150: SPECIAL TOPIC - ENERGY, ENVIRONMENT, AND CLIMATE (4)

This course will develop the physical idea of energy, its manifestations, transformations, and conservation laws. We will examine how energy availability determines the nature of environmental and human systems, how our utilization of energy has transformed the human experience, and how it threatens now to transform our natural environment and climate. We will examine in detail the nature of the current energy-climate connection and potential future scenarios for social and environmental progress. Also listed as PHYS 150.

ES 150: SPECIAL TOPIC - ENTERING NATURE (4)

An exploration of poetry, fiction, and essays that address the perceived borderlands between humans and nature, mind and body, self and world. Concepts of the wild, borders, place, and wonder will remain in focus as we consider descriptions of nature as well as how characters experience instants of revelation and/or the gradual enrichment of the human-centered soil by the cosmological mulch. Authors include Whitman, Rilke, Silko, Hogan, Erdrich, Fowles, and others. No prerequisite.

ES 150: SPECIAL TOPIC - PLANTS OF VIRGINIA (2)

Also listed and described as BIOL 150.

ES 182: ENVIRONMENTAL ETHICS (4)

Also listed and described as PHIL 182. Open to first-year students. No prerequisite.

ES 197F: FIRST YEAR SEMINAR – CONSUMING FRENCH CULTURE (4)

Food is a window into the culture and values of any society, and for the French, food and culture are inseparable. This course explores the idea and reality of French cuisine through critical reflection on culinary history and related socio-economic conditions. Issues explored include: the influence of immigration on France's cuisine and culture; French and E.U. agro-food policies; food security, gleaning, pact against food waste; organic and local foods in schools. Also listed as INTL 197F. Placement to be determined during the summer.

ES 197F: FIRST YEAR SEMINAR – EARTH SCIENCE AND EXPEDITION BEHAVIOR (4)

Your instructors, one trained in the physical sciences, the other trained in outdoor leadership studies, have combined to create a unique experience in this seminar. You will immerse yourself in studies related to earth science and space science while contemplating the scientific, technological, and leadership challenges faced by some of the most renowned explorers. While learning, for instance, about Columbus and Magellan, leaders of great oceanic explorations during the Age of Discovery, you will study ocean science. And, while studying 19th and 20th century explorers, especially ones who led expeditions across vast expanses of land (for example, Lewis and Clark), or across vast deserts of ice (for example, Admundsen and Scott), or up the world's highest mountains (for example, Hillary and Krakauer), you will study aspects of lithospheric science. Studies of science that relate to the atmosphere and space will follow discussions of great adventures in the sky and space, particularly by women who have made important contributions to aviation (for example, Quimby, Stinson, and Earhart) and to space exploration (for example, Tereshkova, Ride, and Collens). Finally, as the class looks to history for general lessons in leadership, you will engage in hands-on activities designed to further your knowledge and understanding of group dynamics and team building and to determine and assess your own personal leadership style. Hands-on activities will include lessons in orienteering and work on ropes courses. Placement to be determined during the summer.

ES 197F: FIRST-YEAR SEMINAR - FROM SOLITARY REVERIES TO TREKS ACROSS DESERTS: THE LANDSCAPES OF FRANCOPHONE CULTURES (4)

How is nature imagined and what is humanity's relation to it? This first-year seminar combines the study of literature, nonfiction, and films to study the relationship between humans and their environment. Through an interdisciplinary and global lens, we examine interactions between human beings and the complex natural world we inhabit. Also listed as INTL 197F. Placement to be determined during the summer.

ES 197F: FIRST-YEAR SEMINAR - INCOMPATIBLES? ECONOMICS, THE NATURAL ENVIRONMENT, AND GLOBALIZATIONS (4)

This seminar offers students an opportunity to learn the fundamentals of economics and understand their interaction with environmental problems. The course introduces students to cross-discipline learning and to the execution of tasks in a group or team environment. Finally, the course gives students an opportunity to learn the basics of how to conduct scholarly research. Group discussions and team presentations based on assigned readings are the regular catalysts. Experiential learning through one or two short trips to think tanks/research centers in the D.C. area will help students sharpen their presentation and oral communication skills. Also listed as ECON 197F. Placement to be determined during the summer.

ES 197F: FIRST-YEAR SEMINAR – LEARNING FROM GAIA: NATURE, MYTH, ARCHAEOLOGY, AND THE ENVIRONMENT IN THE ANCIENT MEDITERRANEAN (4)

Gaia, the earth goddess is invoked by ancient writers as a teacher of justice and balance, illustrating that even in antiquity humans understood they interacted significantly with their natural surroundings. What ancient communities thought about nature can be found in ideas expressed in their mythology, theology, and art. Archaeological remains can reveal traces of ancient use and impact. This course is an introduction to the environmental history of the ancient Mediterranean using ancient sources to discover the ways humans have lived in the natural world. Also listed as CLAS 197F. Placement to be determined during the summer.

ES 197F: FIRST-YEAR SEMINAR - THE NATURE AND CULTURE OF WATER (4)

An exploration of the ways water runs through American nature writing. By close reading, writing, and fieldwork, we examine and experience how authors integrate this "element" into their work, as well as the way water functions as myth, metaphor, ritual, resource, image, and form. The natural and cultural realities of our local and home watersheds will remain in focus as we consider how characters and authors reckon with the presence of water in their worlds. Placement to be determined during the summer. Also listed as ENG 197F.

ES 197F: FIRST-YEAR SEMINAR – THINKING LIKE A MOUNTAIN: DISCOVERY, EXPLORATION, AND CONSERVATION OF OUR NATURAL WORLD (4)

The goal of this course is to develop or reestablish the connections our students have with the natural world. We will spend extensive time outside observing organisms in terrestrial and aquatic habitats, navigating and orienteering, and exploring natural environments through journaling and individual and group-oriented exercises. From these experiences, students will ultimately develop a personal environmental ethic. Also listed as BIOL 197F. Placement to be determined during the summer.

ES 197F: FIRST-YEAR SEMINAR - YOU ARE WHAT YOU EAT: MAKING GOOD FOOD CHOICES FOR YOUR HEALTH AND THE ENVIRONMENT (4)

Why do we make the food choices we make? Do we choose food mainly out of habit, or do we consider what is in it and how it was grown? How does the media and advertising influence our diet? In this course students learn to critically evaluate the foods they eat and the messages food choices send to our bodies and the environment. We will examine where our foods come from, how food production and transportation impact the environment, why excessive use of pesticides has become problematic, and why *trans* fats and genetically modified foods (GMOs) may pose health risks. We will also investigate the energy footprints of processed foods and whole foods, and learn why some scholars advocate locally produced food and plant-based diets as the solution to the many environmental and health issues that surround food. Laboratory investigations will include testing for GMOs in foods, producing cultured and fermented foods, and analyzing our diets for nutritional content. Placement to be determined during the summer. Also listed as BIOL 197F.

ES 207: ECOLOGY (4)

In this course, we explore the structure and function of the natural world. This course examines the relationships between organisms and their physical and biological environment, global patterns of climate and biological life, patterns in population dynamics, as well as structure and change in communities of organisms. Also listed as BIOL 207. Open to first-year students. No prerequisite.

ES 207L: ECOLOGY LAB (2)

Students will have ample opportunity to explore the local environment on weekly field excursions and have several opportunities to carry out their own independent research. Also listed as BIOL 207L. Corequisite: ES 207. Prerequisite: q.

ES 210: WORLD GEOGRAPHY (4)

This course examines the methods of geography applied to global issues, patterns and linkages in the arrangement of human physical resources, mapping and elements of spatial analysis, and area studies. Also listed as INTL 210. Open to first-year students.

ES 219: FOOD, CULTURE, AND SOCIAL JUSTICE (4)

Also listed and described as ANTH/GWS 219. No prerequisite. Open to first-year students.

ES 220: GLOBAL SYSTEMS (4)

ES 220: GLOBALIZATION AND LOCAL RESPONSES (4)

Also listed and described as INTL 220. Open to first-year students. Prerequisite: q.

ES 221: SURVEY OF PHYSICS AND THE ENVIRONMENT (4)

Also listed and described as PHYS 221. Prerequisite: ES 117. Open to first-year students.

ES 230: ECONOMICS AND THE ENVIRONMENT (4)

Also listed and described as ECON 230. Open to first-year students. Prerequisite: ECON 157.

ES 234: GLOBAL WARMING - ENVIRONMENTAL POLITICS AND POLICY (4)**ES 234: ENVIRONMENTAL POLITICS AND POLICY (4)**

Also listed and described as POLS 234. Open to first-year students.

ES 235: FEEDING FRENZY - GLOBAL FOOD POLITICS, SECURITY, AND SUSTAINABILITY (4)

Also listed and described as POLS 235. Open to first-year students.

ES 241: GEOLOGY AND EARTH HISTORY (4)

Planet Earth's development as an integrated physical, chemical, and biological system over the past 4.6 billion years. Topics include: the origins of the solar system, Earth, and Moon; forces driving Earth's chemical and geological differentiation; plate tectonics; origins of life and humans; Earth's system dynamics; humans as geological agents; and Earth's climate system. Also listed as PHYS 241.

ES 250: SPECIAL TOPIC - AN INTRODUCTION TO ENVIRONMENTAL DATA COLLECTION & ANALYSIS (4)

This course offers an introduction to physical measurement theory as applied in the environmental sciences. Course topics will include the physics of measuring devices, device selection, calibration, accuracy and precision, field deployment of instrumentation, the planning of a measurement campaign, and techniques for data post-processing and analysis. The course will be student directed, project-based, and will involve extensive field-work. Also listed as PHYS 250. Prerequisite: ES 117 or PHYS 151 or PHYS 201, or permission.

ES 250: SPECIAL TOPIC – APPALACHIA: ENVIRONMENTAL PROBLEMS AND SOLUTIONS (2)

In this two-credit seminar course, we delve into both the natural and cultural history of the Appalachians, as well as explore current and historical environmental problems. These issues include deforestation, water contamination, species extinction and restoration, sustainable development, and forestry. While most of our explorations take place between the covers of the books we read and in class discussions, we also have the chance for hands-on explorations of at least one small patch of Appalachian habitat. By the end of the course, you should have a better understanding and connection to the life in the hills that surround our Hollins home. Also listed as BIOL 250.

ES 250: SPECIAL TOPIC - CREATIVE NON-FICTION (4)

This course focuses on the writing of creative nonfiction, including personal essays, memoir, and travel writing. Students will develop their writing through the process of sharing their work with others, reading a variety of authors, experimenting with new ways of writing, responding to each other's work, and focusing on revision. The course is open to beginning as well as advanced nonfiction writers. Also listed as ENG 210. Prerequisite: sophomore standing or permission.

ES 250: SPECIAL TOPIC - FIELD VERTEBRATE ZOOLOGY (4)

Also listed and described as BIOL 250. Prerequisites: BIOL/ES 207 and 207L.

ES 250: SPECIAL TOPIC – GLOBAL POLITICS, INDIGENEITY, AND DECOLONIAL THOUGHT (4)

This course introduces indigeneity and decolonial thought as two critical categories of analysis for contemporary global politics. We will look closely at the historical, theoretical and popular development of these border epistemologies. Some of the key topics of discussion include economic and political relations between the state and indigenous nations, environmental positions across borders, cultural practices as a form of citizenship, indigenous forms of governance, land use, water rights, sovereignty and digital networks of resistance. We will begin by grounding our examination here in North America and expand to selected indigenous communities across the Global South. Also listed as GPS 250. Open to first-year students.

ES 250: SPECIAL TOPIC – OPTICS, OPTICAL INSTRUMENTS AND SPECTROSCOPY (4)

Also listed and described as PHYS 250. Prerequisites: CHEM 105 or PHYS 151

ES 250: SPECIAL TOPIC – SPINNING YOUR FOOD WEB (2)

Also listed and described as BIOL 250. No prerequisite.

ES 250: SPECIAL TOPIC – WIND, WATER, AND WEATHER (4)

This course examines the physical principles of earth's dynamic weather systems, utilizing important concepts from physics, geology, hydrology and meteorology. Students will gain a broad understanding of interactions between the atmosphere and fresh and ocean water, including global circulation systems, storms, weather forecasting, the carbon cycle and the greenhouse effect. Special emphasis will be placed on human-induced climate change. Also listed as PHYS 250. Prerequisites: ES 117, PHYS 151, PHYS 201 or permission of instructor.

ES 259: ENVIRONMENT AND SOCIETY (4)

Current environmental problems are primarily the result of human activity, intentional or otherwise, and any solutions to these problems will necessarily require concerted and cooperative human effort as well. This course investigates the complex interactions between human beings and their natural environment from a sociological point of view with an eye toward averting ecocatastrophe in the not-too-distant future. A rudimentary knowledge of biology and chemistry is a recommended prerequisite.

ES 304: GEOGRAPHY OF GLOBAL ENVIRONMENT (4)

Also listed and described as INTL 304. Open to first-year students with permission. No Prerequisite.

ES 305: CULTURAL GEOGRAPHY AND LANDSCAPE STUDIES (4)

Also listed and described as INTL 305. Open to first-year students with permission. No Prerequisite.

ES 328: FIELD VERTEBRATE ZOOLOGY (4)

In this lecture/lab course, we will use vertebrates as our focus as we explore issues of evolution, ecology, physiology, behavior and conservation as well as develop skills associated with studying vertebrates in the field. Beyond the scheduled classes, students are required to participate in a 3 day weekend field trip to the Eastern Shore of Virginia to study avian biodiversity as well as several evening excursions to examine patterns of amphibian biodiversity. Course fee of \$150 is required. Prerequisite: BIOL/ES 207 or permission from instructor. Also listed as BIOL 328. Prerequisite: BIOL/ES 207 or permission.

ES 337: ORNITHOLOGY (4)

Also listed and described as BIOL 337. Prerequisite: ES 207 and 207L.

ES 350: SPECIAL TOPIC - BIOGEOCHEMISTRY (4)

This course examines the control and function of the Earth's global biogeochemical cycles, drawing from the biological, geological, and chemical sciences. We also explicitly address anthropogenic perturbations to biogeochemical cycles and consider future global changes. Topics addressed include the origins of the solar system and of life, global, and regional carbon cycles; nutrient cycling in terrestrial and aquatic environments; trace gas fluxes; and bioactive metals. Attention is given to the tools employed by biogeochemists, such as the use of isotopic tracers, various analytical equipment, and mathematical models. Interactions between global biogeochemical cycles and other components of the Earth system are discussed. Prerequisites include CHEM 101 or 105 and BIOL 117, 207, 241, or permission of the instructor.

ES 350: SPECIAL TOPIC – ENVIRONMENTAL SOCIOLOGY (4)

This course applies theories from sociology, architectural design and science along with field tested market solutions to a range of environmental issues. We examine nature as social construction, the sustainability predicament, consumption and materialism, the ideology of environmental justice relative to theological outlooks, and race, class, gender, and other power dimensions that intersect environmental issues in national and global contexts. Also listed as SOC 350.

ES 350: SPECIAL TOPIC - FIELD VERTEBRATE ZOOLOGY (4)

In this lecture/laboratory course, we will explore evolution, ecology, physiology, behavior, and conservation—using vertebrates as our focus organisms. Students are expected to participate in a weekend field trip to the NC coast (avian biodiversity) as well as to participate in several evening excursions to search for breeding amphibians. Students will develop a much deeper understanding of vertebrate diversity, biology, and conservation issues as well as an understanding of techniques necessary to study vertebrates in natural conditions. Course fee of \$125 required for weekend field trip. Also listed as BIOL 350. Prerequisite: BIOL/ES 207 and 207L.

ES 350: SPECIAL TOPIC – ORNITHOLOGY (4)

Also listed and described as BIOL 350. Prerequisite: BIOL/ES 207 or permission from instructor.

ES 352: TOPICS IN HUMAN GEOGRAPHY (4)

Also listed and described as INTL 352. Open to first-year students with permission. No prerequisite.

ES 357: CONSERVATION BIOLOGY (4)

This seminar examines the impact of current environmental problems (global warming, introduced species, degradation of water resources, land use practices, etc.) on the life-sustaining properties of natural ecosystems, as well as current theories and practices in conservation biology. We not only try to understand the nature, cause, and implications of various environmental issues, but we also explore possible solutions to the problems. Each student has the opportunity to explore a particular environmental problem of interest (from local to global) and present her research. Also listed as BIOL 357. Prerequisites: BIOL 207 and 207L or BIOL 117 and permission of instructor.

ES 357L: LABORATORY FOR CONSERVATION BIOLOGY (2)

Laboratory activities will cultivate an understanding of real-world, hands-on conservation biology through fieldtrips, active discussions, and training on the use of professional tools used by conservation biologists, such as GIS (Geographic Information Systems), which significantly aid in the decision-making process for the management and preservation of biodiversity. Also listed as BIOL 357L. Corequisite: BIOL 357.

ES 390: INDEPENDENT STUDY (2 OR 4)

Independent study conducted at the advanced level. Application must be made with faculty prior to registration.

ES 470: SEMINAR IN ENVIRONMENTAL STUDIES (4)

Students in this capstone course tie together the various academic perspectives that form their major by exploring common readings and presenting (30-45 min.) on a relevant topic of interest. In addition, each student prepares a portfolio (paper, course summaries, internship summaries, cv, résumé) summarizing her academic experience. Students will also explore career options in the ES field as well as graduate school opportunities. This course is intended for senior ES majors and minors.

ES 480: SENIOR THESIS (4)

Students must undertake a research project investigating a specific aspect of environmental studies. Students must consult with the ES director in the spring semester of junior year and if approved, research would traditionally be carried out during Fall and Short Terms.

ES 490: SENIOR HONORS THESIS (4, 4)

Offered to qualified ES majors. Students must consult with the ES director in the spring semester of the junior year. If approved, the research project is completed over Fall, Short, and Spring Terms. Departmental honors will be awarded only if research project is successfully defended to a panel of ES faculty members.

