Environmental Studies Catalog, 2025-26

MAJORS, MINOR

- **PROFESSORS:** Renee Godard (biology, director), Morgan Wilson (biology)
- **ASSOCIATE PROFESSORS:** Pablo Hernandez (economics), Elizabeth Gleim (biology), Mary Jane Carmichael (biology),
- **ASSISTANT PROFESSORS:** Joe Larios (English, visiting) Kaila Thorn (environmental studies)
- **LECTURER:** Suzanne Allison (biology)
- **AFFILIATED FACULTY:** Ashleigh Breske (international studies), Bonnie Bowers (psychology), Genevieve Hendricks (art history), Abubakar Jalloh (public health), Jaeyeon Lee (international studies), Charles Lowney (philosophy), Edward A. Lynch (political science), Thorpe Moeckel (creative writing),

The field of environmental studies and environmental sciences (ES) takes a transdisciplinary approach to understand the relationship between humans and the environment. This field approaches the causes and consequences of environmental problems using skills from the natural and social sciences, the arts, and humanities with a goal to develop potential solutions. The Hollins ES program has two degree options which share a common core curriculum that provide a grounding in scientific, cultural, and historical perspectives on environmental issues.

Students pursuing the B.A. degree in Environmental Studies will focus their studies on the cultural and societal issues in human-environment dynamics, while those pursuing the B.S. in Environmental Sciences will take more classes in the natural sciences. In addition, all ES majors are required to undertake a relevant experiential component (internship, study abroad, service project) before graduation

REQUIREMENTS FOR A MAJOR IN ENVIRONMENTAL STUDIES (B.A.):

12 courses (minimum of 46 credits) and Experiential Component

CORE COURSES (7)

- ES 104: Introduction to Environmental Studies (4)
- ES 105: Introduction to Earth Studies (4)

- ES 207: Ecology and ES 207L (4, 2)
- ES 212: Introduction to GIS (2)
- ES 261: Political Ecology (4)
- ES 262: Research Design and Methods for Environmental Issues (4)
- ES 470: Senior Seminar in Environmental Studies (2)

Note: students receiving a 4 or 5 on the AP Exam in Environmental Science are exempt from taking ES 105

FIVE ADDITIONAL COURSES

(two must be at 300 level, only two can be at the 100 level)

- One course must have an environmental science focus from the list below (lab must be taken with lecture course if offered): ES 225: Energy and the Environment (4); ES 236: Wind, Weather, Water (4); ES 241: Earth History and Geology (4); ES 253/253L: Microbial Ecology (4,2); ES 240:One Health (4); ES 313/313L: Invertebrate Zoology (4,2) ; ES 316: Wildlife Disease (4); ES 328: Field Vertebrate Zoology (4); ES/BIOL 337/337L: Ornithology (4,2); ES 341/341L: Plant Biology (4,2); ES 357/357L: Conservation Biology (4,2); ES 364/364L: Biogeochemistry (4,2)
- Three courses must come from the following list of ES humanities and social science courses and affiliates: ES 182: Environmental Ethics (4); ES 210: World Geography (4); ES 219: Food, Culture and Social Justice (4); ES 221: Globalization and Local Responses (4); ES 230: Economics and the Environment (4); ES 269 Green By Design: Sustainable Architecture and the Environment (4); ES 271: Politics of the World's Oceans (4) ES 373: Environmental Justice (4); ES 391: Research/Service in Environmental Science (4) OR ES 480: Senior Thesis (4); BUS 223: Business Law and Ethics (4); BUS 244: Introduction to Entrepreneurship (4); ECON 157: Microeconomics (4); ECON 259: International Political Economy (4); ECON 312: Economics of Development and Globalization (4); HIST 329: Slavery: A Global History (4); INTL 303: Geopolitics (4); PH 101: Introduction to Public Health (4); PH 201: Epidemiology (4); PH 260: Public Health and Social Justice (4); PH 301: Global Health (4); POLS 226: International Law (4); POLS 363: Constitutional Law (4); REL 218: Buddhist Traditions (4); SOC 234: Social Problems (4); SOC 260: Race, Class and Gender (4); with departmental approval, one or more ES 250 or ES 350 courses could apply to this requirement.
- One course in statistics: STAT 140 Introduction to Statistics (4) or STAT 251: Statistical Methods (4)

EXPERIENTIAL COMPONENT

- All students must complete an experiential component which can include: a related internship ES 399 (2 or 4 credits; any term), completion of the Hollins Outdoor Leadership certificate, participation in the January term Tropical Ecology or Wilderness & Wildlife trips, the School for Field Studies abroad program, ES 391: Research/Service in Environmental Studies/Science, or ES 480/490: Senior Thesis.

REQUIREMENTS FOR A MAJOR IN ENVIRONMENTAL SCIENCE (B.S.):

15-16 courses plus related laboratories (62-76 credits) and Experiential Component

CORE COURSES (7)

- ES 104: Introduction to Environmental Studies (4)
- ES 105: Introduction to Earth Studies (4)
- ES 207: Ecology and ES 207L (4, 2)
- ES 212: Introduction to GIS (2)
- ES 261: Political Ecology (4)
- ES 262: Research Design and Methods for Environmental Issues (4)
- ES 470: Senior Seminar in Environmental Studies (2)
- Note: students receiving a 4 or 5 on the AP Exam in Environmental Science are exempt from taking ES 105

ADDITIONAL SCIENCE COURSES (6-7), lab must be taken with lecture course if offered:

- Introductory Chemistry: CHEM 101/101L and 102/102L (4,2; 4,2) or CHEM 105/105L (4,2)
- One Field-Based ES Elective: ES 253/253L: Microbial Ecology (4,2); ES 313/313L: Invertebrate Zoology (4,2); ES 328: Field Vertebrate Zoology (4); ES 341/341L: Plant Biology (4,2); ES 357/357L: Conservation Biology (4,2); ES 364/364L Biogeochemistry (4,2)
- Three additional ES or affiliated science courses from the following (two must be at or above the 300 level):
    - ES 225: Energy and the Environment (4); ES 236: Wind, Weather, Water (4); ES 241: Earth History and Geology (4); ES 253/253L: Microbial Ecology (4,2); ES 240: One Health (4) or ES 316: Wildlife Disease (4); ES 313/313L: Invertebrate Zoology (4,2); ES 328: Field Vertebrate Zoology (4); ES

337/337L: Ornithology (4,2); ES 341/341L: Plant Biology (4,2); ES 357/357L: Conservation Biology (4,2); ES 364/364L: Biogeochemistry (4,2); ES 391: Research/Service In Environmental Science/Studies (4) or ES 480: Senior Thesis(4); BIOL 236/236L: Cell and Molecular Biology (4,2); BIOL 323/323L: Animal Behavior (4,2); CHEM 214/214L: Analytical Chemistry (4,2); CHEM 221/221L: Organic Chemistry I (4,2); (3 of the courses from the various SFS semester abroad programs can typically be applied to this requirement); with departmental approval, one or more ES 250 or ES 350 courses could apply to this requirement.

STATISTICS COURSES (2)

- PSY 208: Research Statistics (4) or STAT 251: Statistical Methods (4)
- STAT 324: Data Wrangling with R (2)

EXPERIENTIAL COMPONENT

- All students must complete an experiential component which can include: a related internship ES 399 (2 or 4 credits, any term), completion of the Hollins Outdoor Leadership certificate, participation in the January Term Tropical Ecology or Wilderness & Wildlife trips, the School for Field Studies abroad program, ES 391: Research/Service in Environmental Studies/Science, or ES 480 or 490: Senior Thesis.

REQUIREMENTS FOR A MINOR IN ENVIRONMENTAL STUDIES:

6 courses (26 credits)

- ES 104: Introduction to Environmental Studies (4)
- ES 105: Introduction to Earth Studies (4)
- ES 207: Ecology and ES 207L (4, 2)
- ES 261: Political Ecology (4)
- Two additional courses from the list of ES elective courses (must take lab if offered)

COURSES IN ENVIRONMENTAL STUDIES:

ES 104: INTRODUCTION TO ENVIRONMENTAL STUDIES (4)

This course takes a transdisciplinary perspective to provide a foundation on the social scientific perspective of environmental issues. It examines the history of environmental studies as a movement and field of study, and subsequently takes a topical approach to understand the systemic structure of environmental issues. Students will gain insights from anthropology, politics, psychology, sociology, and sustainability studies as they pertain to environmental issues, and will develop an introductory understanding of the qualitative and quantitative methods used to assess these issues. Open to first year students. No pre-requisite. Every spring. (MOD)

ES 105: INTRODUCTION TO THE EARTH SCIENCES (4)

Earth science is the study of the evolution of the Earth as a physical and biogeochemical system over the ca. 4.5 billion years of its existence. This introductory lecture/laboratory course encompasses two of the three main sub-disciplines of the field of environmental science: geology and biogeochemistry. It will cover the structure, composition, and evolution of the Earth, the life it supports, and the physical and biogeochemical processes that govern the formation and behavior of the Earth's materials. Special attention will be paid to the concept of the Anthropocene. Open to first-year students. No prerequisite. Every fall. (SCI, TLAS)

ES 122: WATER AND LIFE (4)

In this combined lecture/laboratory course, we will explore the ways in which water is essential to life on Earth, its origins on our planet, how water affects weather and climate, the function of freshwater and marine ecosystems, and the organisms that live within them. We will also study the history and methods of water usage and treatment, the impacts of human activity on the availability of safe drinking water, and the ongoing and impending global effects of climate change. Students will gain hands-on experience in techniques used to assess water quality and biodiversity of freshwater streams and visit regional water treatment facilities. Not intended for students majoring in biology or environmental sciences. Open to first-year students. Also listed and described as BIOL 122. No prerequisite. Every spring. (SCI, TLAS)

ES 182: ENVIRONMENTAL ETHICS (4)

This seminar applies classical and modern moral theories to environmental issues. It includes philosophical examination of current ecological theory as it relates to environmental science. Central topics include pollution, global warming, population growth, animal rights, environmental degradation, conservation of the biosphere, and

responsibilities to future generations. You are encouraged to think for yourself logically about these and other environmental philosophical issues. Also listed and described as PHIL 182. Open to first-year students. No prerequisite.

ES 207: ECOLOGY (4)

As one of the core courses for the environmental studies major, we will explore the structure and function of the natural world. We will examine 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 and described as BIOL 207. Open to first-year students. No prerequisite. Every fall. (SCI, TLAS: must take lab to fulfill SCI or TLAS)

ES 207L: ECOLOGY LAB (2)

We will explore local aquatic and terrestrial ecosystems as well as gain hands-on experience carrying out ecological research in this field laboratory course. Students will also have several opportunities to carry out their own independent research. Also listed and described as BIOL 207L. Corequisite: ES 207. Every fall. (SCI, TLAS)

ES 209: BACKYARD BIRDS (2)

Have you ever wondered what the names of the birds that frequent your backyard birdfeeder? Do you wish you could identify bird songs? Are you curious about the biology and natural history of birds? In this field-oriented course, students will develop skills enabling them to identify, by both sight and sound, birds common to southwestern Virginia. We will explore a variety of habitats and observe the morphology and behavior of birds in their natural environments during several key points in their annual cycle (over-wintering, migration, and breeding). Not intended for students majoring in ES. Open to first-year students. Also listed and described as BIOL 209. No prerequisite.

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 and described as INTL 210. Open to first-year students. Every spring. (GLO, MOD)

ES 212: INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (GIS) (2)

This course will explore basic concepts of geographic information systems (GIS), including applications of GIS and how to use it. Much of this course will be lab-based using real-

world and simulated scenarios and data sets. Students will gain basic working knowledge of how to us ArcGIS, the most commonly used GIS software on the market, and gain limited experience with one or more additional GIS platforms. Although content and exercises will be primarily targeted to biology and environmental studies majors, skills learned will be applicable to many other fields and thus, non-science majors are welcome. Also listed and described as BIOL 212. No pre-requisites. Not open to first-year students. Every spring.

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

Explores the meanings of food and food-related practices in various cultural contexts in relation to structures of power and inequality, including those shaped by race, ethnicity, gender, class, nationality, and geography. All students will participate in a community partnership project with a local food organization and volunteer a minimum of 20 hours during the semester. Also listed and described as GWS 219. Prerequisite: sophomore standing. (DIV)

ES 220: GLOBALIZATION AND LOCAL RESPONSES (4)

Analyses of international issues and systems based on social science perspectives and methodologies, including statistics. Topics are drawn from the following: trade, finance, and development; diplomacy, terrorism, and security; technology and communication; demographics and immigration; energy and transportation; and the global environment. Also listed and described as INTL 220/POLS 221. Open to first-year students. Prerequisite: q. (Q, GLO)

ES 225: ENERGY AND THE ENVIRONMENT (4)

This course will examine the physics of energy with a focus on human energy use and production and their effect on the environment. It will utilize the physical concepts of work, energy, and power with applications from electricity and magnetism and thermodynamics to provide an understanding of the challenges faced in implementing ecologically and economically sustainable energy. Not open to first years. Prerequisite: ES 105 or permission of instructor. Also listed and described as PHYS 225.

ES 230: ECONOMICS AND THE ENVIRONMENT (4)

This course introduces students to conventional and unconventional views behind the interplay between the economizing problem and nature’s household. Emphasis is placed on the management of natural resources from an economic standpoint. The course explores the general and most urgent natural resources and environmental problems facing humanity, including energy sources, water, agriculture, fisheries, and industrial pollution. The course addresses these environmental problems from the standard

economic approach to environmental distress and the more avant-garde ecological economic approach to nature's household. Also listed and described as ECON 230. Open to first-year students. Prerequisite: ECON 157. Spring (even years) (o, r, GLO, MOD)

ES 236: 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 and described as PHYS 236. Open to first-year students. Prerequisite: ES 105 or permission of instructor.

ES 240: ONE HEALTH: LINKING HUMAN, ANIMAL, AND ENVIRONMENTAL HEALTH (4)

Nearly two-thirds of all human infectious diseases are transmissible to animals and vice versa. One Health is a world-wide movement which focuses on the intersectionality of human, animal, and environmental health and how interdisciplinary efforts can be made to better study and solve these problems. This seminar-based course will take a case study approach to explore concepts and approaches integral to One Health. Key diseases and issues related to human, animal, and environmental health for which this approach could or have been utilized will be explored along with its associated peer-reviewed literature. This course is specifically targeted towards pre-health, pre-vet, and public health students, along with students interested in field biology and environmental science. Also listed and described as BIOL/PH 240. Pre-requisites: BIOL/ES 207/207L, or PH 201, or permission of instructor.

ES 241: EARTH HISTORY AND GEOLOGY (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. Open to first-year students. Also listed and described as PHYS 241. Prerequisite: ES 105 or permission of instructor. Spring (even years) (SCI)

ES 250: FOOD SCIENCE, SOCIETY, AND SYSTEMS (4)

Introductory course into the nutrition and science of food, ways that food shapes and is shaped by society, and the different agricultural and organization systems that food travels

in. This overview is designed to introduce the many ways we engage with our food and help inform the decisions we make about it. No pre-requisite required, not open to first-years, also listed as SOC 250. Spring 2026

ES 250: ARCGIS AND THINKING SPATIALLY (4)

While becoming familiar with Geographic Information Systems (GIS), data structures, and applications in problem solving, students will seek to understand not only the physical world, but how humans interact with that world in both the past and present. In this course, students will focus on learning key skills and concepts necessary to analyze and manipulate data through ArcGIS. Moreover, they will critically consider the visualization, dissemination, and perception of that data. By completing three units centered in environmental studies, sociology, and the study of the ancient world, students will examine the concepts, behaviors, and values that can be used to address issues where study of the natural world intersects with the social sciences.

ES 253: MICROBIAL ECOLOGY (4)

Microbial ecology is the study of microbes in the environment and their interactions with the environment, each other, and plant and animal species. Discipline is at the heart of the function of every ecosystem on the planet, from the lithosphere to the cryosphere, the human body, and the built environment. This course will survey the microbial diversity within the biosphere and delve into the complex interactions between microbial communities and the worlds they inhabit. Also listed and described as BIOL 253 and PH 253. Pre-requisites: For BIOL Majors, BIOL 207/207L and BIOL 220/220L, or permission; ES Majors, ES 105 and ES 207/207L, or permission; For PH Majors, PH 101 and PH 201, or permission. BIOL majors cannot receive credit for BIOL 253/253L and BIOL 312/312L. Fall (odd years) (SCI: Must take lab to fulfill SCI).

ES 253L: MICROBIAL ECOLOGY LAB (2)

This lab will use culture-dependent and -independent techniques and common biogeochemical assays to survey the microbial ecology of a variety of environments. Also listed and described as BIOL 253L or PH 253L. Co-requisite: BIOL, ES, or PH 253. Fall (odd years) (SCI)

ES 261: POLITICAL ECOLOGY (4)

In this course, students will develop an understanding of political ecology, a framework that takes perspectives from anthropology, economics, and political science to understand how historical and systemic structures impact the way that people use, protect, and relate to their environments. Focusing on American environmental politics and policy, this class

will introduce students to key policies, including NEPA, the Endangered Species Act, and the Wilderness Act. Although this class includes components of policy, it focuses on the history of the American landscape, dispossession, and the way current policy is premised on historical values. Also listed as POLS 261. Prerequisite: ES 104 (or BIOL/ES 117). Every fall. (MOD, DJP).

ES 262: RESEARCH DESIGN AND METHODS FOR ENVIRONMENTAL ISSUES (4)

This course will introduce students to the skills of designing a research question and research project, methods for collecting data, and finally, for analyzing data. Students will have the opportunity to design and carry out a mini-research project during this course. By the end of the course, students will understand and be able to carry out reasonable sampling methods, interviews, and surveys. Additionally, students will have a beginning understanding of analyzing data using qualitative and quantitative techniques using MaxQDA and JASP. Pre-requisites: q, and ES 104 (or BIOL/ES 117). Every spring. (Q)

ES 263: TROPICAL ECOLOGY (2)

In this course we will delve into the ecology and biodiversity of two ecosystems of Ecuador: The Amazon rainforest and the high Andean paramo. We will familiarize ourselves with some of the rich biodiversity, explore ecological relationships, and come to understand some of the environmental concerns that threaten this region. In addition, we will explore how science and indigenous knowledge can provide a platform for deepening our understanding of the natural world and for generating positive change. This course is open only to students that have been accepted into the upcoming January term travel/research trip. Also listed and described as BIOL 263. Every fall

ES 269: GREEN BY DESIGN: SUSTAINABLE ARCHITECTURE AND THE ENVIRONMENT (4)

Sustainability denotes one of the main future challenges of societies and the global community. Issues of sustainability range from energy and natural resources to biodiversity loss and global climate change. Properly dealing with these issues will be crucial to future societal and economic development. By examining the progressive development of green architecture in the 20th century, this course will illustrate how it is ever evolving and ameliorated through alterations in form, technology, materials, and use, examining different places worldwide that represent a diversity of cultural and climatic contexts. Also listed and described as ART 269. Open to first-year students.

ES 271: POLITICS OF THE WORLD'S OCEANS (4)

This course is designed to introduce the student to the most important contentious issues, including environmental issues, concerning the world's oceans. Since human beings learned to travel great distances across the seas, they have found themselves in conflict over bases, colonies, and resources, and also over the handling of environmental issues related to the exploitation of the resources. We will begin by looking at the early European presence in the Atlantic, Indian, and Pacific Oceans, and how international law and the international political system sought to handle those conflicts. We will move on to current issues concerning the oceans, from fishing to cruising. Open to first years. Also listed and described as POLS 271. (MOD, GLO)

ES 290: INDEPENDENT STUDY (2 OR 4)

Independent study conducted below the advanced level. Application must be made with faculty prior to registration. Offered any term.

ES 313: INVERTEBRATE ZOOLOGY (4)

Invertebrates, members of the animal kingdom lacking a backbone, comprise 95 percent of the animals on Earth

today. In this course, students explore the anatomy, physiology, behavior, ecology, and taxonomy of this incredibly diverse group of animals. Also listed and described as BIOL 313. Prerequisite: BIOL/ES 207 or BIOL 220. Fall (even years)

ES 313L: LAB FOR INVERTEBRATE ZOOLOGY (4)

This laboratory provides students the opportunity to explore the anatomy of invertebrate organisms, the environments in which they live, and the techniques used to classify them. Exercises will be conducted in both the laboratory and the field. Beyond the designated laboratory meeting times, students will be expected to participate in a weekend field trip (Thursday-Sunday) to the Virginia Institute of Marine Science Eastern Shore Laboratory in late September. In addition, students will be expected to participate in 1-2 other day or evening excursions to study invertebrates. The cost of rooms and meals for the weekend trip will be shared by participants ($150-200 required). Also listed and described as BIOL 313L. Corequisite: BIOL/ES 313. Fall (even years)

ES 316: WILDLIFE DISEASE (4)

This lecture/lab course will provide a general understanding of disease ecology and examine both common and newly emerging diseases that are known to impact wildlife. We will also work to better understand the roles these diseases play in population regulation,

conservation of rare and endangered species, and the impacts that these diseases can have on human and domestic animal health. Lab components of the course will involve both field and laboratory-based experiences involved in routine testing of wildlife and/or vectors for pathogens. Also listed and described as BIOL/PH 316. Prerequisites: BIO/ES 207/207L, BIO 236/236L, or PH 201, or permission. (SCI, TLAS)

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. The cost of rooms and meals for the weekend trip will be shared by participants ($150-200 required).. Prerequisite: BIOL/ES 207 or permission from instructor. Also listed and described as BIOL 328. Prerequisite: BIOL/ES 207 or permission. Spring (even years).

ES 337: ORNITHOLOGY (4)

With nearly 10,000 recognized species, the taxonomic class Aves is one of the most diverse groups of animals on earth. In this lecture course students will explore the anatomy, physiology, behavior, taxonomy, evolution, and life history of birds. Also listed and described as BIOL 337. Prerequisite: ES 207 and 207L. Spring (even years).

ES 337L: LABORATORY FOR ORNITHOLOGY (2)

Students in this field laboratory course will explore the life history of birds, observe them in their natural environments, and learn to identify them by sight and sound. Students will be expected to participate in a weekend field trip (to either the North Carolina coast or Eastern Shore of Virginia) and in several other morning/evening activities. The cost of rooms and meals for the weekend trip will be shared by participants ($150-200 required). Also listed and described as BIOL 337L. Corequisite: BIOL/ES 337. Prerequisite: BIOL/ES 207 or permission. Spring (even years).

ES 341: PLANT BIOLOGY (4)

In this course, students will gain a foundational comprehension of the structure, function, and diversity of plants and will be challenged to build an integrated understanding of plants, from an awareness of their molecular biology to their roles in an ecosystem. We will then tap into this knowledge to engage in active learning experiences to recognize and appreciate practical applications of plant biology, including conservation and the

important connections of plants to society. Also listed and described as BIOL 341. Prerequisite: BIOL/ES 207. Fall (odd years)

ES 341L: LABORATORY FOR PLANT BIOLOGY (2)

Laboratory sessions will provide hands-on experiences in laboratory and field settings. A significant portion of the lab will be field-based with time being spent learning to identify native and common invasive plants, with particular focus on woody species. Students will also conduct a multi-week research project and present their findings. Also listed and described as BIOL 341L. Co-requisite: BIOL/ES 341. Fall (odd years)

ES 350: SPECIAL TOPIC: ECOCINEMA (4)

This course examines the subfield of ecocinema, in which the medium of film is used to explore environmental issues, whether this is done through narrative fiction, documentary, or experimentation. Possible themes include environmental catastrophe, wilderness, animal rights, climate change, human-nature relations, and environmental justice. Students will use traditional methods of film criticism and ecocriticism to explore these topics.

ES 357: CONSERVATION BIOLOGY (4)

In this course, students will apply active learning strategies to build a conceptual foundation for conservation biology, including conservation values and ethics. Building on this foundation, we will explore the primary threats to biological conservation, including habitat degradation, overexploitation, invasive species, and biological impacts of climate change. We will also explore how to apply this knowledge through learning about and utilizing various professional approaches used to solve conservation problems. Students will also be expected to participate in a weekend field trip to Front Royal Virginia & Washington D.C. to explore conservation biology research and efforts occurring at the Smithsonian and U.S. Botanic Garden. Course fee of $150-200 required. Also listed and described as BIOL 357. Prerequisites: BIOL/ES 207 and 207L or permission.

ES 357L: LABORATORY FOR CONSERVATION BIOLOGY (2)

Laboratory activities will cultivate an understanding of real-world, hands-on conservation biology through completing various field- and computer-based activities. Several multi-week research projects will occur to help develop skills in experimental design, technical skill sets, and data analysis. As a whole, students will learn a variety of field techniques and quantitative methods commonly used in the management and conservation of biodiversity. Also listed and described as BIOL 357L. Prerequisites: BIOL/ES 207 and 207L. Corequisite: ES 357.

ES 364: BIOGEOCHEMISTRY: AN ANALYSIS OF GLOBAL CHANGE (4)

Much like the human body, the Earth's climate and ecological systems have been finely tuned to maintain homeostasis. In the human body, this occurs via feedback loops and exchange between major organ systems. In the Earth's climate and ecological systems, this balance is maintained by the flow of energy and materials. Biogeochemistry is the study of the flow of energy and materials within the biosphere. In this course, we will cover processes that control the cycling of C, N, and P and other biochemical elements in terrestrial and aquatic systems, with special emphasis placed on the coupling between human and natural systems. Topics include the origin of Earth and the development of elemental cycles, the Earth as a chemical system, the biogeochemical cycling of elements in the atmosphere, lithosphere, and biosphere, the global cycles of H2O, C, N and P, and the expanding human footprint on biogeochemical processes. Prerequisites: CHEM 101/102 or CHEM 105, BIOL 207 or ES 105. Also listed and described as BIOL 364. Fall (even years)

ES 364L: BIOGEOCHEMISTRY LABORATORY (2)

The biogeochemistry laboratory will introduce students to common analytical techniques used to assess the biogeochemical transformation of nutrients in the environment. Co-requisite: ES 364. Also listed and described as BIOL 364L. Fall (even years)

ES 373: ENVIRONMENTAL JUSTICE (4)

Environmental justice refers to both a field of study and an activist movement. Both the realm of study and activism focus on the way the different groups of people are differently impacted by environmental issues. This course examines the roots of environmental justice, considers the role of citizen activism and citizen science, and considers the systemic roots of environmental injustices in the United States, its territories, and the broader North American continent. Additionally, the course incorporates applied examples and experiences from the field in adjacent study areas including public health and sociology. Also listed and described as PH 373 and SOC 373. Prerequisite: ES 104, 117, PH 201, or SOC 110. (DIV, DJP)

ES 390: INDEPENDENT STUDY (2 OR 4)

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

ES 391: RESEARCH/SERVICE IN ENVIRONMENTAL SCIENCE/STUDIES (4)

Students conducting independent research in environmental studies/science, or those engaged in the development and implementation of a significant service project relating to

environmental sustainability on campus or in the community, should sign up for this course in consultation with their faculty supervisor. Research students are expected to produce a formal scientific report at the conclusion of the study which includes a significant literature review. Students implementing a service project are expected to write a well-researched proposal and "plan of action" as well as a summary reflection paper. Offered both terms.

ES 399: INTERNSHIP (4)

Application must be made with faculty prior to registration. May be proposed in any term.

ES 470: SEMINAR IN ENVIRONMENTAL STUDIES (2)

Students in this capstone course tie together the various academic perspectives that form their major by exploring common readings and presenting (30-45 minutes) on a relevant topic of interest. In addition, each student prepares a portfolio (paper, course summaries, internship summaries, c.v., 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. Every fall.

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 the research project is successfully defended to a panel of ES faculty members.