ENVIRON SCI & SUSTAINABILITY (ENSS)

ENSS 0--. ENVIRON STUDIES LOWER LEVEL. (1-10 Credits)
Lower Level Coursework in Environ Sci & Sustainability
Level: Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Transfer
Schedule type(s): Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 1--. ENVIRON STUDIES UPPER LEVEL. (1-10 Credits)
Upper Level Coursework in Environ Sci & Sustainability
Level: Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Transfer
Schedule type(s): Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 015. INTRODUCTION TO ENVIRONMENTAL SCIENCE. (1 Credit)
This introductory course is designed to provide the core foundation for students majoring in environmental science or sustainability and resilience. Throughout the semester, student will learn about faculty-led research in the disciplines, professional networks that help students develop their skills, and other ways they can get involved in environmental issues on campus. In preparation for ENSS37, Case Analysis, students will develop basic skills associated with solving environmental problems by role playing in real world scenarios.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 022. METEOROLOGY: SCIENCE AND WEATHER. (0-4 Credits)
Introduces students to short-term interactions between the atmosphere, oceans, and land, and how these interactions produce weather. The course covers various meteorological topics, including atmospheric structure and circulation, fronts and air masses, extreme events such as thunderstorms, tornadoes, and hurricanes, and forecasting.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: Physical Science

ENSS 026. ETHOLOGICAL METHODS. (3 Credits)
This course will provide a hands-on introduction to the methods of direct and indirect behavioral observation, including the development of observation techniques, ethogram construction, field methods, use of video and other technologies, appropriate data management and analysis. The course will have a significant component of experiential learning, including each student's individual design and execution of a substantial behavioral observation project.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 013 (may be taken concurrently) or PSY 024 (may be taken concurrently) or BIO 025 (may be taken concurrently)
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Web Instructed
Area(s) of Inquiry: None

ENSS 035. ONE EARTH: GLOBAL ENVIRONMENTAL SCIENCE. (3 Credits)
Introduces basic ecological concepts before taking up human interactions with the earth and how science is a tool for environmental problem-solving. Includes discussion of models of population growth, the concept of the commons, thermodynamics, and complex policy issues such as biodiversity, risk-assessment, climate change and energy. An interdisciplinary course with special emphasis on critical thinking. Concurrent enrollment in ENSP 036 (laboratory) available.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Life Science, Scientific Literacy

ENSS 036. ONE EARTH LABORATORY. (1 Credit)
Hands-on lab and field exercises designed to enhance understanding of concepts discussed in ENSP 35. Includes environmental testing and data collection, visits to various sites of environmental interest, and an independent project. Concurrent enrollment in ENSP 35 required.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ENSS 035 (may be taken concurrently) or ENSP 035
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Web Instructed
Area(s) of Inquiry: Scientific Literacy

ENSS 037. ENVIRONMENTAL CASE ANALYSIS. (3 Credits)
Environmental Case Analysis is a team-based learning course designed for Environmental Science and Policy majors in their sophomore year. Students will develop scientific and policy responses to three major case studies, each focused on a problem in a different area of environmental studies. Students will be introduced to interdisciplinary analysis, the use of primary literature in problem-solving, and addressing complexity.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Enrollment limited to students with a classification of Sophomore.

Enrollment is limited to students with an area(s) of study in Environmental Policy, Environmental Science or Environ Sustain & Resilience.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Information Literacy

ENSS 041. PRINCIPLES OF GEOLOGY. (3 Credits)
Introduction to the science of geology, its principles, methods and theories as they are employed in studying planet Earth. The importance of geological knowledge in understanding problems of natural resources, hazards, and land use is emphasized. No prereq. Laboratory required.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: Physical Science, Scientific Literacy

ENSS 042. PRINCIPLES OF GEOLOGY LAB. (1 Credit)
The course will provide students with interactive exercises that explore geologic processes and dynamics ranging in scale from atoms to the solar system. Students will engage with each other in both laboratory and field environments employing common techniques and instruments used in the geosciences. Concurrent or previous enrollment in ENSP 041 required.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ENSS 041 (may be taken concurrently) or ENSP 041 (may be taken concurrently)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Web Instructed
Area(s) of Inquiry: Physical Science, Scientific Literacy

ENSS 050. SPECIAL TOPICS IN ENVIRONMENTAL SCIENCE AND SUSTAINABILITY. (1-3 Credits)
A forum for new, introductory-level academic inquiries into environmental science and sustainability. Contact the ENSS director for details.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 054. ENVIRONMENTAL COMMUNICATION. (1,3 Credits)
This course focuses on the role of communication in shaping distinctions and relations between ""culture"" and ""nature"", in representing environments for audiences, and in advocating for or against particular environmental policies and practices. We will critically examine 1) how publics come to view environments through representations in a variety of media; 2) problems of efficacy and ethics in the public discourse, forums, and voices playing a part in environmental controversies and debates; 3) our own practices of advocacy. We also will be reflecting on the relationships between all of these arenas-- the theory, critique, and practice of environmental communication.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen

ENSS 061. ENVIRONMENTAL SOCIOLOGY. (3 Credits)
Environmental sociology examines the relationship between human communitites and the natural environment in the modern world. In particular, it focuses on how political, economic, and cultural institutions shape our interactions with the natural environment. This course also considers how societies are responding to environmental problems on a global and local level, with special attention to the intersection of environmental problems and social inequality. Specific topics of study may include industrial pollution, environmental ideologies, global climate change, and natural disasters, among others.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): SCSS 001 or SCSA 001 or SCSS 009 or SCSS 010 or SCSS 012 or SCSS 014 or SCSS 015 or SCSS 016 or SCSS 017 or SCSS 020 or SCSS 025
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 065. GEOGRAPHIC INFORMATION SYSTEMS. (3 Credits)
Introduction to Geographic Information Systems: This course is designed for students who wish to learn the basics or increase their knowledge of introductory concepts of this rapidly expanding field. GIS concepts and applications are discussed in a multi-disciplinary context. Students explore ESRI's Arc View software including the tools used to input, manage, analyze, and display geographic information.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 071. ENVIRONMENTALISM IN THE U.S.. (3 Credits)
This course uses sociological concepts and methods to examine contemporary environmental movements. Students will learn about the idealogical and organizational diversity of environmental movements, consider beliefs and experiences that lead people to participate in these movements, and study the ways that environmental activism is shaped by social structure and social institutions. Movements considered may be ones that focus on wilderness protection, animal rights, anti-pollution activism, environmental justice, buying ""green,"" and others.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Enrollment is limited to Undergraduate level students.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen, Values and Ethics

ENSS 072. ENVIRONMENTAL PSYCHOLOGY. (3 Credits)
An introduction to the field of environmental psychology. Psychology needs ecology; ecology needs psychology. The field of psychology cannot continue to ignore the ecological context of human life, and environmentalists need psychologists to help them understand human behavior, which is the root cause of most contemporary environmental problems. The purposes of this course are to survey central issues in the emerging field of ecological psychology, to examine competing conceptions of this field, and to review our growing understanding of the relationship between human beings and the physical environment. We'll study global problems, their environmental effects and mechanisms, and explore possible solutions based on behavioral interventions. Prerequisite: PSY 001
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): PSY 001
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 101. RESTORATION ECOLOGY PRACTICUM. (1-3 Credits)
Teaches advanced field observational skills using pro- blems in plant biology, animal ecology, and physical geology in conjunction with an exploration of American environmental literature by Annie Dillard, Aldo Leopold, Henry Thoreau and John Muir. Students are challenged to develop new scienti- fic and outdoor skills and make deeper, personal connections to the land. Involves out-of-state travel to a wilderness setting, short hikes, stays in group cabins, journal keeping and a 24-hour solo camping experience.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 002 or BIO 012 and ENSS 035 and ENSS 036
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 103. FOUNDATIONS NAT HIST & ENVIRON. (3 Credits)
For centuries, the connection between humans and the natural world has been the focus of considerable philosophical and scientific debate, with authors such as Darwin, Thoreau, Leopold, Abbey, Dillard, and Wilson providing contrasting viewpoints of the role of nature in human constructs. This course will explore the writings of these authors and others, with an emphasis toward the development of modern environmentalism and the creation of conservation ethics based on student interpretations of historical and modern naturalist literature. Furthermore, students will be expected to analyze and critique the value that different authors place on natural history through a series of writing assignments and outdoor natural history exercises. Cross-listed with ENG 130.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 107. CIVIC ENVIRONMENTALISM AND GROWTH. (3 Credits)
Civic Environmentalism and Smart Growth is a course about the social, political, economic, and environmental consequences of urban sprawl. Through the study of policy history and current debates, students learn about the patterns of auto-dependency that characterize urban growth in the United States.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 108. ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS. (3 Credits)
Analysis of allocative efficiency, sustainability, and policy consequences for different types of environmental and natural resources using microeconomic methods. Topics include market failure, valuation methods, water & air pollution, climate change, water, land, and ecosystem services valuation.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): (MATH 020 or MATH 050 or MATH 070 or MATH 080 or MATH 100) and ECON 002
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen

ENSS 109. ZOO/GREAT APE PRACTICUM. (2 Credits)
Supervised experience in daily practices and routine protocols used in captive animal management. Conducted at off-campus locations.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Credit/No Credit with IP
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 111. INTERNATIONAL ENVIRONMENT SEMINAR. (3-4 Credits)
The International Environmental Seminar enables students to gain an appreciation of the ecological and social aspects of environmental issues through an intense immersion experience in a developing country. Students will explore aspects of sustainable development and environmental justice within a specific national context. In general, discussion topics will include tropical ecology, the politics of land use, the effects of conflict on environmental systems, and the interaction between economic development and sustainability. Permission of the Instructor is required.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen, Global and Cultural Understand

ENSS 115. ENVIRONMENTAL FIELD COURSE. (0-6 Credits)
Extended outdoor experience on an environmental topic. Contact ENSS department for details.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 119. REGIONAL ECOLOGY. (3 Credits)
An in-depth study of the ecology of a specified region or type of ecosystem, which will be specified on a per-semester basis. The course will analyze the ecological structure and function of the region, the interaction between humans and both the biotic and abiotic components of the ecosystem, and how our current understanding of conservation science and policy affects our ability to formulate management and regulatory strategies to facilitate sustainable development. May be repeated for credit once, with change of region.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 013 or ENSP 035 or ENSS 035
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen, Life Science, Scientific Literacy

ENSS 125. CONSERVATION BIOLOGY. (0-4 Credits)
Application of ecological theory to managing Earth's biodiversity. Includes consideration of ethical and political frameworks, definitions of species, population genetics, landscape ecology, design of parks and preserves, ecology, and sustainable development. Features case study approach, student-led discussions of primary literature, lab and field experiences including a required weekend trip. Prereqs.: BIO 117-118L or consent of instructor. Cross-listed with BIO 125. Laboratory required.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 117 and BIO 118L
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 127. ENDANGERED SPECIES CONSERVATION. (3 Credits)
This course addresses the challenges of species conservation, with a focus on endangered species, from a global perspective. Topics will include relevant treaties and laws (e.g., CITES and the U.S. Endangered Species Act), the development of the IUCN red list, and Species Survival Plans used in captive animal population management. This course will also study how scientists apply the principles of conservation biology in the developing world, and how emerging socioeconomic challenges place increasing pressure on biologists to find innovative ways to merge science and policy.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 128. ZOO DESIGN AND OPERATIONS. (3 Credits)
This course will provide an overview of the field of zoo biology, with emphases on the role of zoos in conservation, species survival plans, captive management of small populations of exotic animals (especially including endangered species), and the use of behavioral research and environmental enrichment methods in captive animal welfare. The course typically will meet at Blank Park Zoo and will have a significant component of experiential learning.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 013 and (BIO 025 or PSY 024)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter with IP
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 135. GLOBAL CLIMATE CHANGE: THE SCIENCE AND POLICY OF GLOBAL WARMING. (3 Credits)
An interdisciplinary investigation of anthropogenic global change, using ""global warming"" as a semester-long case study. Students learn an effective approach to investigating a major environmental issue by first obtaining a strong scientific background in the issue, building computer and conceptual models to test scenarios, and finally investigating various policy options. Climate physics, paleoclimatology, biology, uncertainty analysis, economics, and risk assessment are some of the tools students will learn to apply to these issues.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): MATH 020 or MATH 050 or MATH 070
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Physical Science

ENSS 138. WATER RESOURCES AND POLICY. (3 Credits)
We will explore the management of water resources and policy in the United States, from the local to national level, and countries across the globe. The field of water resources and policy is inherently interdisciplinary, and we will be analyzing issues from legal, social, economic, and ecological perspectives. The course is designed to enhance the critical thinking skills of all students through readings, involved discussions, independent research paper, and a group synthesis at the end of the semester.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 150. ADVANCED TOPICS IN ENVIRONMENTAL SCIENCE. (0-4 Credits)
A forum for new, advanced-level academic inquiries into environmental science and sustainability. See ENSS director for details.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 151. SUSTAINABILITY AND RESILIENCE. (4 Credits)
Sustainable systems are those that can continue their core functions indefinitely without degradation; resilient systems are those that can continue their core functions in the face of rapid, and often unexpected, change. In this course we explore what makes something sustainable and resilient and develop techniques to measure and assess environmental, economic, and social sustainability and resilience in real-world systems and institutions.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ENSS 035 or ENSP 035
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture/Lab Combo, Web Instructed
Area(s) of Inquiry: None

ENSS 153. ECOLOGICAL ECONOMICS. (3 Credits)
In this course we will investigate interactions between ecological and economic systems. We will investigate the sources of environmentally-relevant market failures, and discuss under what circumstances different types of market mechanisms (such as taxes and cap-and-trade) might lead to more economically efficient outcomes. We will also investigate some of the basic assumptions of neo-classical economics (an ""empty world"" pre-analytic vision, utility maximization), and ask questions like ""Under what circumstances economic growth may be problematic?"" and ""What is the economy really for?""
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ECON 002
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 154. ENVIRONMENTAL DECISION-MAKING. (3 Credits)
In this course, students will take a look at some of the most widespread quantitative techniques for environmental decision-making, including dynamic modeling, cost-benefit analysis, contingent valuation, and risk/uncertainty analysis. We will construct simple computer models and analyses to get a good sense of what these tools can do and where they break down. Students will learn how to use these tools and how to be a skeptical consumer of information provided by others. Along the way, we will explore ethical, scientific, and practical critiques of the use of these techniques, and explore how the worldviews of various disciplines clash when dealing with the application of various quantitative environmental policy tools.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): MATH 020 or MATH 028 or MATH 050 or MATH 070
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 156. ENVIRONMENTAL POLITICS/POLICY. (3 Credits)
The objectives in this course are to present theoretical models and case studies that familiarize students with the fundamental processes that produce environmental policy. Environmental Politics and Policy provides an analytical framework for making sense of the origin and limitations of landmark legislation. Prereq.: POLS 001 or ENSS 035 or instructor's consent. Cross-listed with POLS 156.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): POLS 001 or (ENSS 035 and ENSS 036) or (ENSP 035 and ENSP 036)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen

ENSS 157. ENVIRONMENTAL JUSTICE. (3 Credits)
Environmental justice explores the hypothesis that hazardous industrial activity occurs disproportionately in lower income and/or minority neighborhoods. We will look first at the way that knowledge about toxic hazards enters the public sphere, as well as the role of experts and citizens interpreting that information. Then we examine the history of the environmental justice movement, current policy choices and numerous case studies.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Values and Ethics

ENSS 158. SUSTAINABLE TRANSPORTATION. (3 Credits)
This course explores the various ways transportation infrastructure is connected to sustainability issues through its environmental/ecological, social justice, and public health impacts. Students will explore transportation as more than getting from point A to B but as essential infrastructure for civic participation in everyday life. We'll think about individual travel behavior, choices, and patterns and how those connect with policies on transportation modes and zero-emissions vehicles. The class will be a mix of field trips, guest speakers, group projects, seminars, and critical writing.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 159. ZOO/GREAT APE INTERNSHIP. (3 Credits)
Supervised practical experience in husbandry, management, and research in a captive animal setting. Involves progressively greater responsibility and probable involvement in research, depending on the performance of individual student. Specific work assignments will vary based on the needs of the host institution and the individual professional goals of the student.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Students with a classification of Freshman or Sophomore may **not** enroll.

Primary grade mode: Credit/No Credit with IP
Schedule type(s): Independent Study, Internship, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 162. HYDROLOGY. (0,4 Credits)
The study of hydrology investigates the movement and cycle of water throughout the Earth system, from the flow of water in streams and aquifers to evaportransportation and precipitation within Earth's atmosphere. We will discuss the foundational theories and concepts governing the movement of water, investigate how water forms landscapes, and explore our role in the global water cycle.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ENSS 041 or ENSP 041
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 163. SUSTAINABLE COMMUNITIES. (3 Credits)
This course explores how concerns about social equity, environmental welfare, and resilience in the face of rapid and disruptive change are shaping the character of human communities in the 21st century. Using ideas from the interdisciplinary fields of urban studies and community planning, students will investigate how processes of political advocacy, decision making, and sustainable design are occurring in cities, suburbs, and towns. The course also includes a community-engaged learning component that will bring students into dialogue with planners and residents in the city of Des Moines.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): SCSS 001 or SCSA 002 or ENSS 035 or ENSP 035
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Engaged Citizen

ENSS 165. APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS. (3 Credits)
This course acquaints students with ""real world"" GIS solutions by taking a project from concept to completion; this includes generating project proposals, acquiring and creating data, performing spatial analysis, project pre- sentation, and product delivery. Students learn to identify issues at all phases of a GIS project and work with the client and fellow team members to creatively solve problems. Client and consultant relationships are established by working with Central Iowa agencies and organizations. Students are exposed to internship opportunities and are able to network with professionals in a variety of fields.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ENSS 065 or ENSP 065
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 168. DYNAMIC ENVIRONMENTAL MODELING. (3 Credits)
Dynamic models are critical tools in the analysis of time-dependent systems. Many environmental systems are dynamic in this way: local populations may fluctuate in response to the appearance of a nonnative species; the risk associated with a pulse of pollutants may depend upon how quickly downstream mixing can occur; and the adaptation ability of species might be a function of the rate of change in ecological conditions. In this course, we will construct dynamic models, learn how to parameterize them even in the face of imperfect data, and discuss generalized patterns exhibited by complex environmental systems, such as overshoot, resilience, oscillations, and chaos. Prereq: any college-level mathematics or statistics course.
Level: Graduate, Law, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 099 or MATH 020 or MATH 050 or MATH 070 or MATH 100 or STAT 050 or STAT 060 or STAT 061 or STAT 071
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 187. HISTORY OF THE ENVIRONMENT. (3 Credits)
The environmental history of the continent and nation stretches from geologic time to the present. This course begins by defining different aspects of environmental history and introduces ways that the environment has been influential in shaping past human experience, as well as how humans have in turn shaped the environment. While surveying the sweep of American history through the lens of environment, special attention will be paid to historicizing present-day topics. Themes include the interconnectedness of people and nature, health (ecological and social health is an environmental issue), and the link between local and global. The course balances the physica (rocks, conservation and ecology) and the cultural (ideas, perceptions and images) environment.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 188. URBAN ENVIRONMENTAL HISTORY. (3 Credits)
Earn your urban ranger patch! study the history of urban environments, the place of the city in American cultyre, the development of cities and suburbs, and the city's role in regional and global environmental issues. With the class, explore urban ecology and the evolution of infrastructure, like sewers, waterworks and transportation networks. Potential main topics include urban planning, campus sustainability. New Orleans and historicizing Hurricane Katrina, and Midwestern flooding. Subjects engaged over time and in multiple cities include: environmental justice, tension over resource management, industrialization, food supply, and geography's relation to social structure. Includes a research project.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions:
Students with a classification of Freshman may **not** enroll.

Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 191. ENVIRONMENTAL SCIENCE AND SUSTAINABILITY PRACTICUM. (3 Credits)
A seminar that brings aspects of biology, chemistry, geology and policy formulation to bear on a contemporary environmental topic such as energy, soil conservation, hydrology, climate change, land use planning, sustainability or ecosystem ecology. May involve construction of models, performance of simulations or empirical tests. Open as an elective to all Drake seniors; required capstone for ENSS seniors.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ENSS 193. ENVIRONMENTAL LAB ASSISTANT. (2 Credits)
Directed experience in laboratory instruction. May involve helping staff with set-up, conducting and evaluating of lab and field experiences. In preparing to help students learn material, assistants have the opportunity to re-examine their own knowledge and acquire practical experience alongside a teaching mentor. By invitation or approval of instructor for specific ENSS offerings.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Web Instructed
Area(s) of Inquiry: None

ENSS 196. ENVIRONMENTAL INTERNSHIP. (1-4 Credits)
Extended, usually off-campus experience involving an environmental theme. May include work in local or state government, with law or consulting firms, conservation groups, nature centers or news agencies. Written report or public oral presentation upon completion. Prereqs: BIO 001 or equivalent, CHEM 002/004, ENSS 035-036, and consent of director.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 002 or BIO 012 and CHEM 002 and CHEM 004 and (ENSS 035 or ENSP 035) and (ENSS 036 or ENSP 036)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter with IP
Schedule type(s): Independent Study, Web Instructed
Area(s) of Inquiry: None

ENSS 197. ENVIRONMENTAL RESEARCH. (1-4 Credits)
Extended experience developing a particular scientific question concerned with the environment. May be of independent design or part of larger projects mentored by academic, government, or industry scientists. Collaborative, but student must take the lead in acquisition and analysis of data. Written report or public oral presentation upon completion. Prereqs: BIO 001 or equivalent, CHEM 002/004, ENSS 035-036, and consent of director.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): BIO 002 or BIO 012 and CHEM 002 and CHEM 004 and (ENSS 035 or ENSP 035) and (ENSS 036 or ENSP 036)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Web Instructed
Area(s) of Inquiry: None

ENSS 198. INDEPENDENT STUDY. (1-4 Credits)
Involves student-led inquiry into an environmental topic of interest as approved by the director and in association with at least one faculty mentor. Culminates in written report; other details arranged.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Web Instructed
Area(s) of Inquiry: None