

Environmental Sciences

Master of Science - Environmental Sciences

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Departmental Goals and Objectives

The mission of the Department of Environmental Studies is to provide students with the advanced interdisciplinary training necessary for addressing environmental problems. Graduates of the department are prepared for diverse careers in environmental fields.

The principal emphasis in the MS degree is on professional development. The graduate degrees are designed for those who intend to enter the job market for the first time, as well as for mid-career professionals. Faculty work with each student to create a specialized educational plan (developed before or during the first semester of study). Students should consult advising documents for their chosen degree and concentrations.

The Master's Degree

The curriculum for the MS in Environmental Sciences allows students to gain strong scientific understanding of ways to study, evaluate, and interpret environmental realities and their impacts, as well as to manage and mitigate environmental problems. Objectives are to enable students to:

1. develop a basic literacy in the natural and social sciences and the humanities as they contribute to an understanding of environmental issues;
2. critically analyze environmental problems;
3. identify, research, and evaluate environmental problems; and
4. compare, contrast, implement, and manage short- and long-term solutions to environmental problems. The department recommends that students interested in the Environmental Sciences degree have prior knowledge of chemistry, algebra, statistics, and biology.

Three concentrations are available:

- ES - General
- ES - Environmental Planning and Management
- ES - Sustainable Development and Policy

Advising

All new on-ground students must participate in a graduate student orientation before their first semester. New online students must complete a similar orientation online. In conjunction with his or her academic advisor, each student must prepare an educational plan before or during completion of the first semester of study. The educational plan is submitted to the department chair for final approval.

Degree Requirements

- Academic essay of at least 300 words addressing the following:
 1. What are the most urgent environmental problems facing your community today?
 2. How will a master's degree in environmental studies help prepare you to address these problems?
 3. Which area of environmental specialization appeals most to you?
 4. A brief description of your academic background, including life experiences, that contribute to your academic preparation.
- Two informative letters of recommendation from professors or employers addressing applicant's academic ability, work ethic and personal integrity
- General Environmental Science Concentration Only: Must have identified a faculty member who agrees to serve as research advisor before application will be considered. Applicants to the Environmental Planning and Management or Sustainable Development and Policy concentrations do not need prior approval from a research supervisor in order to apply.

Required Core Courses

ENS 551	Environmental Natural Sciences	4
ENS 552	Environmental Social Sciences and Humanities	4
ENS 553	Research Methods in Environmental Science	4
Concentration Requirements and Electives		24
Closure		4
Total Hours		40

Educational Plan

Development of an educational plan is a key activity through which student and academic advisor identify course work appropriate for the student's background, aspirations, and needs. The plan indicates the courses for the chosen degree and concentration, and is developed prior to or during the first semester of study. Upon completion of the plan the advisor and Department chair review the plan. Minor amendments (such as electives) may be made during the course of study with approval of the academic advisor; significant changes in direction (changes between concentrations or degrees) also require the approval of the Department chair and necessitate a Change of Curriculum form. Variances from Department requirements must be indicated and approved through a **Student Petition** process.

Grading Policy

Students must maintain a cumulative GPA of 3.0 on a scale during their course of study. A maximum of four hours of C (2.0) grades (a grade of C- or lower will not be acceptable) is applicable to an ENS degree, provided each hour of C is balanced by an hour of A (a grade of A- will not be accepted), and an approved **Student Petition** is on file in the Office of Records and Registration. Failure to maintain an overall graduate grade point average of 3.0 or higher will result in initiation of academic dismissal by the Department of Environmental Studies. Courses that are offered on a letter-grade basis must be taken for a letter grade.

NOTE: Students also should refer to the campus policy on Grades Acceptable Toward Master's Degrees section of this catalog.

Master's Closure

MS candidates, with the assistance of their advisors and graduate committees, are required to complete one of the three available

closure options. For some ENS students, the culminating experience of graduate-level work is a formal thesis. Other ENS students develop a substantial and carefully-designed graduate project, such as an interpretive plan for a nature center, an exhibit for a museum or visitors' center, a film or multimedia show with supportive materials, or a finished and well-researched draft of environmental legislation or policy. ENS students are required to present and defend their thesis/graduate project proposal and completed thesis/graduate project before the graduate committee. The third closure option is the Capstone Closure course. The Capstone Closure option is not available to students in the General Environmental Science Concentration. The Capstone Closure option involves the completion of a 240-hour professional internship while enrolled in ENS 550. Before enrolling in ENS 550, capstone students must identify a suitable internship site and develop an internship plan in consultation with their internship site supervisor and the capstone instructor. The capstone instructor determines whether the proposed internship activities and learning goals meet departmental standards. Prior approval of the internship plan is required in order to register for ENS 550. While enrolled in ENS 550, students submit regular progress reports and complete a final capstone presentation and a comprehensive final capstone report summarizing and analyzing their accomplishments and learning experiences during the internship.

Students enroll for thesis or graduate project credit hours with the approval of their thesis/graduate project advisor. Students must enroll in a total of four credit hours of closure; however, they may accrue the total in increments (thesis and graduate project only). Once students begin taking closure hours, they are required by campus policy to be enrolled in at least one closure hour per regular semester (fall and spring) until the four-credit hour closure requirement is completed. If the closure exercise is not completed by the time four credit hours have been completed, students must register for zero credit hours (one billable hour) of ENS 511, ENS 529, or ENS 557 (as applicable) in all subsequent regular semesters (fall and spring) until the closure exercise is completed.

Online Master's Program

Students interested in the MS in Environmental Sciences can obtain their degree online with the same curricula as the on-campus programs. Students must apply specifically for the online degree. Applicants to the MS General Environmental Science Concentration must have the approval of a research advisor before their application will be considered. Applicants to the MS in Sustainable Development and Policy or the MS in Environmental Planning and Management do not need prior approval from a research advisor in order to apply.

The online MS in Environmental Sciences degree can be completed entirely online. This format allows students to complete their degree from any location in the world while participating in a dynamic online community with instructors dedicated to their success. The online MS program contains the same curricula as the on-campus program and is mostly taught by on-campus faculty members.

Graduate Certificates

- Graduate Certificate in Geographic Information Systems

Courses

ENS 101. Women and the Environment. 3 Hours.

This course will examine how gender has influenced environmental movements in both developed and developing countries over the past three decades. Emphasis will be placed on the role of women in environmental protection, health, and justice movements. Students in this course will understand why women, along with other oppressed groups, experience environmental damages disproportionately and why the well-being of the natural environment is a feminist issue. Course Information: This course fulfills a general education requirement at UIS in the area of Comparative Societies Social Sciences.

ENS 151. Earth Science. 3 Hours.

This course introduces the physical processes and materials on our planet including natural resources, natural disasters, and climate. Understanding the dynamics that make up Earth and the discoveries leading to this understanding allows us to grasp the impact the Earth has on society and our impact on the Earth. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab (IAI Code P1905).

ENS 201. Literature and the Environment. 3 Hours.

Explore and examine the historical chronology of principle American and European literature addressing the relationship between humans and the natural environment. Course Information: This course fulfills a general education requirement at UIS in the area of Humanities.

ENS 251. Introduction to Environmental Sciences. 3 Hours.

Basic processes and dynamics of ecosystems and development of societal values pertinent to earth resources. Major environmental questions examined, along with options and implications involved in resolution. Course Information: This course fulfills a general education requirement at UIS in the area of Life Science without a Lab (IAI Code: L1 905).

ENS 262. Environmental Physical Geography. 3 Hours.

The physical elements of the landscape are examined with attention focused on climate and weather, the water balance, landforms, soils and vegetation. Interrelationships between the various environmental elements and their influence on the changing natural landscape are noted. A variety of environmental problems are examined. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab.

ENS 271. Introduction to Sustainability. 3 Hours.

The course will introduce students to the concept of sustainability and examine the ways in which human systems and human agency can impact environmental conditions. We will analyze this concept and consider a number of different definitions, applications and critiques. Students will develop knowledge of sustainability from several viewpoints within the social and natural sciences. The course will also demonstrate how humans can take actions to reverse environmental harm and improve sustainability.

ENS 301. Environmental Justice in America. 3 Hours.

Evaluates environmental justice as a public policy by exploring issues of inequities and discrimination resulting from use and abuse of the environment through human settlement, industrial facility siting, and environmental rules and regulations.

ENS 304. Mapping our Physical and Social World. 3 Hours.

In this course, students will begin to explore the ways in which we map our world and our reasons for doing so. The course covers basic mapping concepts and includes the creative and analytical elements of map development. Students will have the opportunity to explore various mapping technologies, learn how data for maps are acquired and analyzed in our digital world, and discover applications for use in the social and natural sciences.

ENS 311. ECCE: Global Change in Local Places. 3 Hours.

This course will examine environmental transformations in a global perspective. In doing so, we will seek to understand how changes in global social systems and environmental systems are interrelated. A major focus will be on the processes of "globalization" in the modern world system, and examining the ways in which it relates to environmental issues, with an emphasis on social justice. The course will help us to develop a deeper understanding of the ways that global social processes affect diverse communities throughout the world by focusing on environmental change, and in return how these changes in ecological systems affect communities and social life. We will explore a number of environmental transformations and locations developing an interdisciplinary analysis that draws on the social and natural sciences. Course Information: This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of Global Awareness.

ENS 331. ECCE: Evolution and Creationism. 3 Hours.

Examines the controversy over teaching creationism in public schools. Addressing the problem from several perspectives including the natures of science and religion and the characteristics of creationism and scientific evolution. Also addressed are the issues of public policy, First Amendment rights and the courts' decisions. Course Information: This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of ECCE U. S. Communities.

ENS 332. ECCE: Cultural Geography. 3 Hours.

Explores the cultural processes of human interaction with the environment. Includes understanding of the geographic diversity, distribution and diffusion of people across the world, through such cultural processes as ethnicity, religion, language, politics, agriculture, and economic means. Course Information: Same as GBL 331. This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of Global Awareness.

ENS 334. Restoration and Conservation of Rivers in North and South America. 3 Hours.

This course explores conservation biology and restoration ecology in the context of two case studies. The U.S. study will be the middle reach of the Illinois River, which has undergone degradation, conservation and restoration. The area of focus in Brazil will be the Upper Rio Parana, the last stretch of river with no dams. Course Information: Same as BIO 334.

ENS 381. Foundations of Environmental Policy. 3 Hours.

Introduces the major frameworks of US Environmental Policy. Examines the trajectory of environmental policy development from its inception to the present considering aims, means, successes, and persistent as well as emergent challenges. International environmental policy and selected examples from non-US national contexts are also addressed.

ENS 401. ECCE: Environmental Justice: Science, Policy, and Activism. 3,4 Hours.

This course investigates connections between environmental quality and social justice in U.S. and international contexts. Does pollution pose unfair risks to some groups more than others? Do humans have moral obligations toward animals or ecosystems? Do global climate policies help or hurt locals? Students will explore such questions and ways people work to solve them. Course Information: This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of Global Awareness.

ENS 403. Transportation: Problems and Planning Procedures. 3,4 Hours.

Primary attention is given to the American metropolitan transportation problem. Basic transportation planning methodologies are presented and transportation energy efficiency is evaluated. Case studies on transportation problems are presented.

ENS 404. Fundamentals of Geographic Information Systems. 4 Hours.

Introduction to the concepts and tools of geographic information system and science. Emphasizes basic concepts of design and application of GIS in a variety of fields. Hands-on experience with GIS software.

ENS 405. Fundamentals of Remote Sensing. 4 Hours.

The main objective of this course is to introduce students to the principles and techniques necessary for applying remote sensing to diverse issues in natural resources. The course emphasizes a hands-on learning environment with theoretical and conceptual underpinnings in both aerial and satellite remote sensing. Primary focus will be placed on digital image interpretation, analysis, and processing for a broad range of applications.

ENS 411. ECCE: Introduction to Environmental Education. 4 Hours.

Presents an overview of environmental education content and strategies for teaching all levels of students about the environment. Students will explore identification, evaluation, and application of instructional resources including K-12 environmental education. Course Information: This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of ECCE U. S. Communities.

ENS 412. World Environmental Thought. 4 Hours.

Examines human reactions to natural surroundings in a variety of cultural contexts, including ancient Chinese, Hindu, African, Native American, and Judeo-Christian. Compares and contrasts attitudes concerning the value of wilderness and the exploitation of natural resources. Considers the problem of understanding nature and our relationship with nature as human beings. Course Information: Same as HIS 459.

ENS 415. Undergraduate Research. 1-4 Hours.

Advanced investigation of specific interaction between people and environment. Course Information: Student must have permission of the faculty member under whom the work will be done. Substantial research paper required.

ENS 418. ECCE: American Environmental History. 4 Hours.

Study of the American land that examines human attitudes toward both the wilderness and the quest for resources and the actual use and abuse of the natural world. Beginning with the 16th century, the course focuses on the conflicting advocacies of exploitation, preservation, and conservation. Course Information: Same as HIS 438. This course fulfills an Engaged Citizenship Common Experience requirement at UIS in the area of U.S. Communities.

ENS 419. Environmental Law. 4 Hours.

Surveys the major federal statutes and regulatory schemes relating to environmental quality; analyzes and compares the contrasting approaches to regulation that have been used. Focuses on the interaction of law and policy and considers the roles of Congress, the regulatory agencies, and the courts in defining and implementing environmental mandates. Course Information: Same as LES 419, MPH 419, and PSC 419.

ENS 420. Key Concepts and Cases in Environmental Law. 3,4 Hours.

Examines classic and contemporary cases in environmental law, with attention to social, political, and ecological context as well as legal reasoning. Students will investigate how environmental issues are framed by US constitutional provisions, and linked through legal mobilization with a diverse range of concerns, including natural resource use, private property, religious culture, and economic development. The course will conclude by considering instances of environmental legal mobilization.

ENS 421. Environmental Economics. 4 Hours.

Basic theoretical tools necessary to examine current environmental problems from an economic standpoint. Covers externalities, cost assignment, and environmental problems associated with economic growth.

ENS 422. Environmental Sociology. 4 Hours.

The goal of this course is to provide an introduction to some of the key areas of research in the sub-discipline of environmental sociology, a field of inquiry that focuses on the relationship between society and the biophysical environment. We will explore how human societies affect their environments, and how human societies are shaped by their environments, as well as how we come to recognize and understand changing environmental conditions. Course Information: Same as SOA 422.

ENS 425. Ecological Issues. 3 Hours.

This course introduces students to the basic concepts and models of ecology, loosely divided into three sections that consider the important ecological factors influencing individuals, populations, and communities and environmental issues facing them. Course Information: This course cannot count toward the MS in Environmental Science or the MA in Environmental Studies.

ENS 440. Topics in Environmental Studies. 1-4 Hours.

Intensive study of a current environmental issue. Description of topic for a given semester will be stated in the course schedule.

ENS 444. Aquatic Ecology. 4 Hours.

Fundamentals of freshwater ecology, including abiotic-biotic interactions, aquatic ecosystem structure and function, relationships among organisms. Lecture and lab. Course Information: Same as BIO 444. Prerequisite: Ecology or permission of instructor.

ENS 445. Biology Of Water Pollution. 4 Hours.

Effects of organic wastes, industrial chemicals, and nonpoint source pollutants on aquatic flora and fauna and humans. Laboratory involves detection and measurement of water pollution by toxicity testing and field sampling. Course Information: Same as BIO 445. Prerequisite: Ecology or permission of instructor.

ENS 446. Population and Public Policy. 3,4 Hours.

Study of the size, composition, distribution, and socio-economic aspects of national and global populations using a multidisciplinary approach. Investigate sources of demographic data. Study population theories in understanding the interactions between population growth, economic development and environmental qualities. Learn about impacts of population changes on environmental, health, and development.

ENS 447. Environmental Chemistry. 4 Hours.

Chemical principles behind various environmental processes and analytical chemistry techniques used to solve environmental problems will be introduced. Interactions between the geosphere, the hydrosphere, and the atmosphere will be explored. Issues of waste remediation, disposal and energy resources will be addressed. Course Information: Same as CHE 431.

ENS 448. Sustainable Food Systems. 3,4 Hours.

This course will examine social processes related to food production and consumption. It will look at the history of agricultural production and food systems, transformations in the modern era, and future sustainable alternatives.

ENS 449. Agricultural Politics & Policy. 3,4 Hours.

Students will learn how various political forces over the last hundred years have shaped food production in the United States and explore current trends and controversies. We will highlight the agricultural subsidies, conservation programs, agrochemicals and biotechnology, food safety, organic farming, and the scale and distribution of farmland.

ENS 451. Undergraduate Capstone. 3 Hours.

This is the culminating course in the environmental studies BA degree and must be taken during a student's final undergraduate year. The course will integrate knowledge from the diverse areas of environmental thought. It will bring together important program themes and apply knowledge, competencies and skills acquired throughout the program. The central project for the course is an independent research paper or other approved product that will document the student's ability to incorporate the knowledge from the program and apply it to an original project. Course Information: Prerequisite: ENS 251 and ENS 271.

ENS 455. Introduction to Environmental Consulting. 4 Hours.

Environmental consultants assist clients with regulatory compliance using environmental science, geology and geochemistry. Students will be introduced to environmental consulting by a project manager currently working in the field. Emphasis will be placed on practical science, environmental regulations, site investigation, risk assessment, remediation, project management and case studies.

ENS 461. Geopolitics: Geographical Aspects of International Affairs. 3,4 Hours.

Examines strategic geopolitical issues; problems relating to food, natural resources, population change, and technological development will be evaluated regarding international development. Addresses global issues from a geographic perspective.

ENS 463. Our Changing Climate. 3,4 Hours.

Examines processes that cause the earth's climates to change. Focuses on the role of humans as active and passive agents of climatic change. Future potential ecosystem and landscape changes are discussed. Course Information: This course fulfills a general education requirement at UIS in the area of Physical Science without a Lab.

ENS 464. Paleocology. 4 Hours.

Paleocology is the study of the interaction of organism with one another and with the physical surroundings in the geologic past. In addition to an introduction of methodology, this course will emphasize the practical aspects of using paleocology to understand current and future conditions in light of environmental change.

ENS 465. Water Resources and Society. 4 Hours.

Beginning with a historical perspective on human use and influence of water, this course samples the basics of the hydrologic cycle and water science, worldwide water quality and quantity issues, and water laws and the subsequent conflicts, both domestic and international.

ENS 468. Environmental Geology. 4 Hours.

Relationships between humans and the geological environment, using examples from Midwestern natural history as case studies. Topics include geologic principles, ground water, energy, minerals, mining, pollution, and preparation of decisions on the geologic environment.

ENS 471. Culture and Conservation. 3,4 Hours.

Protected areas are a key part of a global strategy to conserve biodiversity, but ecological goals are sometimes undermined by social and political conflict. This course will explore strategies for better integrating local communities (and "culture") in protect areas management to improve the social and environmental sustainability of conservation initiatives.

ENS 472. Urban Environments. 3,4 Hours.

This course questions the idea that cities are places where nature is absent. It will investigate cities from ecological and social science perspectives by exploring the role of nature in urban development, the implications of urban activities on local and distant ecosystems, and the social values that guide urban practices and sustainability.

ENS 475. Political Ecology AKA The Political Life of Trees, Trash, & Turtles. 3,4 Hours.

Political ecology examines the everyday politics of environmental science and environmental studies. This includes focus on how humans develop and apply science to non-humans (such as trees, CO₂, garbage, French fries, and turtles), and the contexts in which science takes place. Students will learn and apply research methods and questions from natural sciences, economics, political science, and ethics to understand how diverse societies address environmental challenges.

ENS 476. Environmental Ethics. 3,4 Hours.

Introduces students to the multidisciplinary nature of environmental ethics, major philosophical issues and arguments within the growing field of environmental ethics, and the application of environmental ethics to environmental issues and problems.

ENS 477. Renewable Energy. 3,4 Hours.

This course provides an overview of renewable energy, including technologies such as passive and active solar thermal, photovoltaics, wind turbines, hydropower, biomass, and alternative transportation options. Students will learn about the basics of energy, energy conservation strategies, energy-efficient design principles, grid design, politics of energy, and energy related careers.

ENS 479. Writing and the Environment. 4 Hours.

Writing intensive author workshop which explores literary perceptions of environment in theme and style of the nature genre.

ENS 481. Forest Policy & Management. 3,4 Hours.

This course provides a survey of historical and current U.S. forest management policies and the effects of those policies on management practices. Students will also explore the contributions of public perceptions of forest and scientific understandings of forest systems to developments in forest management policies and to changes in management practices.

ENS 483. Environmental Policies: National Environmental Policy Act. 4 Hours.

Examine the history and design of the National Environmental Policy Act (NEPA). Evaluate contemporary critiques of NEPA and learn best practices for improved environmental planning through NEPA.

ENS 485. Environmental Policies: Water Quality. 4 Hours.

Clean Water Act of 1987 and amendments and their effect on water quality. Analysis of administrative procedures, standards, and regulations.

ENS 488. China's Environment and the World. 3,4 Hours.

This course examines the historical, cultural, and institutional contexts of environment change and actions in China. The course also assesses the interplays of drivers and processes at multiple levels - local to global - that shape China's environment, past and present, and what those challenges mean for the future of the world.

ENS 499. Undergraduate Tutorial. 1-6 Hours.

Intended to supplement, not supplant, regular course offerings. Students interested in a tutorial must secure the consent of the faculty member concerned before registration and submit any required documentation to him or her.

ENS 501. Land Use and Environmental Planning. 4 Hours.

Examines land use and environmental planning principles and practice. Methods of preparing an effective land use and environmental plan including analysis, formulation of policies, planning tools and techniques, and plan evaluation are discussed.

ENS 503. Advanced GIS Applications. 4 Hours.

Advanced techniques and applications of geographic information system. Topics covered include GIS data structure, data analysis, GPS data acquisition, geodatabase, GIS modeling, and Geo-statistics.

ENS 505. Historic Environmental Preservation. 4 Hours.

Preservation policies and their applications in planning are considered. History of preservation movements and of American architecture and landscapes are examined, as well as current preservation technologies. Case studies of the politics and economics of preservation. Field work required. Course Information: Same as HIS 505.

ENS 510. Thesis. 1-4 Hours.

NOTE: If the thesis is not completed by the time four hours are accrued in continuing enrollment, students must register for ENS 511 for zero credit hours (one billable hour) in all subsequent semesters until the thesis is completed. Course Information: May be repeated to a maximum of 4 hours. Prerequisite: ENS 553.

ENS 511. Thesis Continuing Enrollment. 0 Hours.

Refer to NOTE in course description for ENS 510. Course Information: May be repeated.

ENS 515. Graduate Research. 1-4 Hours.

Advanced investigation of specific interaction between people and environment. Student must have permission of the environmental studies department faculty member under whom the work will be done. Substantial research paper required for credit, maximum of four hours may be applied toward M.A. or M.S. degree.

ENS 520. Graduate Project. 1-4 Hours.

NOTE: If the project is not completed by the time four hours are accrued in continuing enrollment, students must register for ENS 529 for zero credit hours (one billable hour) in all subsequent semesters until the project is completed. Course Information: May be repeated to a maximum of 4 hours. Prerequisite: ENS 553.

ENS 529. Graduate Project Continuing Enrollment. 0 Hours.

Refer to NOTE in course description for ENS 520. Course Information: May be repeated.

ENS 530. Internship. 1-6 Hours.

Focused learning experience in an applied setting with a detailed workload plan in place. Internship cannot be located at UIS. ENS 530 cannot count toward a degree if ENS 550 is used as the closure exercise. Course Information: Requires permission of instructor.

ENS 540. Topics in Environmental Studies. 1-4 Hours.

Intensive study of a current environmental issue. Description of topic for a given semester will be stated in the course schedule. Course Information: May be repeated if topics vary.

ENS 542. Ecosystem Management. 4 Hours.

Introduces the history of ecosystem management, provides the biological and ecological background necessary for ecosystem management, and incorporates various human dimensions to implement such knowledge for effective ecosystem management. Class sessions will combine lectures, discussions, group case study, and field trips. Course Information: Prerequisite: Ecology, conservation biology, or permission of instructor.

ENS 544. Concepts of Ecology Laboratory. 1 Hour.

Field and lab-based analysis of basic ecological principles and concepts applicable at scales ranging from individuals to ecosystems. Course Information: Co-requisite: ENS 546.

ENS 545. Comparative Cultural Ecology. 4 Hours.

Examines diverse human cultures through comparative analysis of human interaction with the natural environment. Explore human-ecological interaction and its theoretical development.

ENS 546. Concepts Of Ecology. 3 Hours.

Introduces basic ecological principles and concepts, structures and functions of ecological systems, habitat analysis with focus on terrestrial ecosystems, and collection and analysis of data. Course Information: Corequisite: ENS 544. Laboratory work required.

ENS 550. Capstone Closure. 4 Hours.

Application of fundamentals in a professional setting; meets program and campus requirements for master's degree closure. NOTE: If ENS 550 is not completed during the initial four-hour enrollment, students must register for ENS 557 for zero credit hours (one billable hour) each fall and spring semester until the requirements for ENS 550 are completed. Students who complete ENS 550, but earn a No Credit grade, must repeat ENS 550 within one year. A second grade of No Credit will preclude a student from earning an ENS degree. Course Information: Prerequisite: Approved Internship Plan; 28 + hours, including the ENS core.

ENS 551. Environmental Natural Sciences. 4 Hours.

Scientific knowledge required to understand and to solve environmental problems. Basic concepts of earth science, physics, chemistry, biology, and ecology explored to bring the biological and physical world into perspective as an integrated continuum of structures, processes, and functions.

ENS 552. Environmental Social Sciences and Humanities. 4 Hours.

Concepts and methods of sociology, anthropology, history, demography, economics, political science, psychology, geography, philosophy, and literature explored in integrative fashion. Focus on understanding processes, patterns, and alternatives of relationships of society to the biophysical world.

ENS 553. Research Methods in Environmental Science. 4 Hours.

Prepares students for independent research toward their thesis/project. Course focuses on improving the following skills: critical thinking, environmental research, design, and data analysis. Concept paper for thesis or project developed.

ENS 556. Environmental Issues and the Media. 4 Hours.

This course will examine the media's coverage of environmental issues, as well as the media's influence on cultural context, social understanding of environmental concerns, and environmental policy.

ENS 557. Capstone Closure Continuing Enrollment. 0 Hours.

Refer to NOTE in course description for ENS 550. Course Information: May be repeated. Prerequisite: Instructor approval.

ENS 571. Sustainable Development. 4 Hours.

The interdisciplinary study of a conceptual framework for development that recognizes the interlocking nature of environmental, economic, and social conditions: degradation in any one of these areas weakens the sustainability of the others.

ENS 581. Environmental Policy and Analysis. 4 Hours.

Identify different environmental policy designs used in the management of air, water, and natural resources. Employ discourse analysis to examine strengths, weaknesses, and underlying assumptions associated with different policy design choices.

ENS 587. Natural Resources: Policy and Administration. 4 Hours.

Review the legal and institutional frameworks for managing water, grasslands, forests, wilderness, fish, and wildlife. Identify challenges to effective natural resource policy implementation in the U.S. and highlight emerging policy solutions.

ENS 589. The Public and Environmental Planning. 4 Hours.

Public involvement is a part of many municipal, state, and federal decision making processes involving the environment. This class examines the history of public involvement in environmental decision making, introduces theories of public involvement, and prepares students to apply best practices for public involvement in environmental planning. Course Information: Same as PAD 589.

ENS 599. Tutorial. 1-12 Hours.

Intended to supplement, not supplant, regular course offerings. Students interested in a tutorial must secure the consent of the faculty member concerned before registration and submit any required documentation to him or her.