

ENVIRONMENTAL STUDIES, M.A.

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Degrees offered: Master of Arts, Undergraduate Minor

The goal of the environmental studies department is to enhance society's ability to create an environmentally acceptable future. Faculty with diverse backgrounds in the social and natural sciences and in the humanities are committed to developing interdisciplinary approaches to environmental problem solving. The primary objective is to educate citizens and professionals who are aware of environmental issues and their origins, causes, effects, and resolutions.

The curriculum is designed for students to gain an understanding of ways to balance social and economic needs with environmental realities, to learn how to use resources imaginatively for sustained yields, and to become aware of the role of values in issue formulation and policy making. Ob-

jectives are 1) understanding of key environmental problems; 2) enhanced awareness of human dependence on the environment; 3) knowledge of the historical roots of environmental problems and the impact of human activities over time; 4) skill in stating issues in environmental policies and actions; 5) basic literacy in the natural and social sciences and the humanities as they contribute to an understanding of environmental affairs; and 6) ability to evaluate short- and long-term solutions to environmental problems.

Four concentrations are available: environmental humanities; environmental sciences; natural resources and sustainable development; and policy, planning, and administration.

Contact: Information about the environmental studies program is available at (217) 206-6720. Information can also be requested at ens@uis.edu.

THE MASTER'S DEGREE ENTRANCE REQUIREMENTS

Students with bachelor's degrees from accredited colleges and universities will be considered for admission to the M.A. program following an examination of their applications by the Graduate Admissions Committee. Full admission requires a GPA of at least 3.00 (on a 4.00 scale). Students with a GPA between 2.50 and 3.00 will be considered for conditional admission. If the Graduate Admissions Committee recommends conditional admission, the student is expected to complete satisfactorily (B or better) ENS 551 and ENS 552 during his/her first year in the program.

All applicants for admission to the environmental studies department must complete a graduate application to the campus. They must also submit to the department a letter of application that states their academic and vocational goals and two letters

of recommendation from either professors or employers. Complete transcripts should be sent to the admissions office as part of the application for admission to UIS. The Graduate Admissions Committee will make its decision after the application file is complete. Applicants will be notified of their status as soon as possible. For further information about admission requirements, contact the environmental studies department.

GRADING POLICY

A maximum of eight hours of C grades is applicable to a degree, provided they are balanced by an equal number of A grade hours.

ADVISING

During the first semester of study, each student selects a faculty adviser who assists the student in defining objectives, in selecting courses within the framework of concentration and specialization requirements, and in developing the master's thesis or graduate project.

In conjunction with his/her adviser, the student must prepare an educational plan before completing ENS 553 Seminar I. Completion of ENS 553 is contingent on completion of the educational plan, which is

submitted to the department chair for final approval.

DEGREE REQUIREMENTS

Core

ENS 546 Concepts of Ecology or equivalent	4 Hrs.
ENS 551 Environmental Natural Sciences	4 Hrs.
ENS 552 Environmental Social Sciences and the Humanities	4 Hrs.
ENS 553 Seminar I	3 Hrs.
ENS 554 Seminar II	<u>1 Hr.</u>
Total core	16 Hrs.

Concentrations and Electives

Total of concentration and electives (See below).	<u>28 Hrs.</u>
Total	44 Hrs.

*Closure

Each graduate degree candidate must complete one of the following closure options.

ENS 520 Graduate Project	4 Hrs.
ENS 510 Thesis	<u>4 Hrs.</u>
Total	48 Hrs.

*Many students will also want to take ENS 530 In-

ternship (4 hours) in conjunction with their closure exercises. Students who hold Graduate Public Service Internships may use four hours of internship seminar (PAD 460) toward their environmental studies degree. (See also Internships, page 249.)

CONCENTRATIONS

The principle emphasis in the M.A. degree in environmental studies is on professional education. Each student specializes in one of four concentrations. The concentrations are designed for people who intend to enter the job market for the first time, as well as for midcareer professionals. Students should consult advising documents for their chosen concentrations as well as the information provided below.

REQUIREMENTS OF THE CONCENTRATIONS

Environmental Sciences (28 Hrs.)

Provides a strong scientific and technical focus. There are two options: general environmental science and risk science. The department recommends that students entering the environmental sciences concentration have knowledge of organic chemistry, algebra, statistics, geology, and biology.

General Environmental Science Option

<i>Required</i>	8 Hrs.
ENS 449 Environmental Toxicology	4 Hrs.
BIO 571 Advanced Ecology	4 Hrs.

Select 12 Hrs. from the following:

ENS 444 Aquatic Ecology	4 Hrs.
ENS 445 Biology of Water Pollution	4 Hrs.
ENS 462 Environmental Physical Geography	4 Hrs.
ENS 521 Environmental Risk Assessment	4 Hrs.
ENS 522 Risk Assessment: Air, Land and Water	4 Hrs.
ENS 525 Site Bioremediation/Remediation	4 Hrs.
ENS 526 Risk Management and Communications	4 Hrs.
ENS 527 Project Management	4 Hrs.
CHE 415 Biochemistry I	4 Hrs.
CHE 421 Instrumental Analysis	4 Hrs.
CHE 425 Interpretive Spectroscopy	3 Hrs.
MPH 511 Foundations of Epidemiology	4 Hrs.
MPH 514 Analytical Epidemiology	4 Hrs.
ENS 555 Analytical Tools for the Environmental Sciences <i>or</i>	4 Hrs.
BIO 402 Biometrics <i>or</i>	4 Hrs.
POS 503 Graduate Research Methods	4 Hrs.

Electives : 8 Hrs.
Other courses may be selected if approved by the student's adviser and the program faculty.

Risk Sciences Option

<i>Required:</i>	12 Hrs.
ENS 449 Environmental Toxicology	4 Hrs.
ENS 521 Environmental Risk Assessment	4 Hrs.
ENS 522 Risk Assessment: Air, Land, and Water	4 Hrs.

Select 8 Hrs. from the following:

ENS 419 Environmental Law	4 Hrs.
ENS 421 Environmental Economics	4 Hrs.
ENS 523 Risk Assessment Practicum	4 Hrs.
ENS 524 Environmental Decision Making	4 Hrs.
ENS 526 Risk Management and Communication	4 Hrs.
ENS 527 Project Management	4 Hrs.
MPH 511 Foundations of Epidemiology	4 Hrs.
MPH 514 Analytical Epidemiology	4 Hrs.
ENS 555 Analytical Tools for the Environmental Sciences <i>or</i>	4 Hrs.
BIO 402 Biometrics <i>or</i>	4 Hrs.
POS 503 Graduate Research Methods	4 Hrs.
ENS 581 Environmental Policy	4 Hrs.

Other courses may be selected if approved by the student's adviser and the department chair.

Electives: 8 Hrs.
Appropriate courses will be selected from within or without the environmental studies department in consultation with the student's adviser.

Natural Resources and Sustainable Development (28 Hrs.)

Explores theories of sustainable use and administration of natural resources, including water, energy, and agricultural land.

<i>Required:</i>	8 Hrs.
ENS 487 Natural Resources: Policy and Administration	4 Hrs.
ENS 581 Environmental Policy	4 Hrs.

Select 12 credit hours:

ENS 403 Transportation Problems and Planning Procedures	4 Hrs.
ENS 404 Techniques of Environmental Planning: Remote Sensing and GIS	4 Hrs.
ENS 419 Environmental Law	4 Hrs.

ENS 421 Environmental Economics	4 Hrs.
ENS 445 Biology of Water Pollution	4 Hrs.
ENS 463 Our Changing Climate	4 Hrs.
ENS 468 Environmental Geology	4 Hrs.
ENS 483 Environmental Policies: National Environmental Policy Act	4 Hrs.
ENS 484 Environmental Policies: Air Quality	4 Hrs.
ENS 485 Environmental Policies: Water Quality	4 Hrs.
ENS 486 Solid and Hazardous Wastes: Technology and Policy	4 Hrs.
ENS 489 Pollution Prevention	4 Hrs.
ENS 501 Environmental Planning: Land and Resource Use	4 Hrs.
ENS 502 Land Use Planning: Principles and Practices	4 Hrs.
ENS 504 Environmental Modeling with GIS	4 Hrs.
ENS 547 Environmental Agriculture	4 Hrs.
<i>Elective:</i>	8 Hrs.

Appropriate courses will be selected from within or without the environmental studies department in consultation with the student's adviser.

Environmental Policy, Planning, and Administration (28 Hrs.)

Emphasizes policy and planning processes and the administration of policy and planning.

Required:

ENS 487 Natural Resources: Policy and Administration	4 Hrs.
ENS 501 Environmental Planning: Land and Resource Use	4 Hrs.

Select 12 Hrs. from the following:

ENS 403 Transportation Problems and Planning Procedures	4 Hrs.
ENS 404 Techniques of Environmental Planning: Remote Sensing and GIS	4 Hrs.
ENS 419 Environmental Law	4 Hrs.
ENS 483 Environmental Policies: National Environmental Policy Act	4 Hrs.
ENS 484 Environmental Policies: Air Quality	4 Hrs.
ENS 485 Environmental Policies: Water Quality	4 Hrs.
ENS 486 Solid and Hazardous Wastes: Technology and Policy	4 Hrs.

ENS 489 Pollution Prevention	4 Hrs.
ENS 502 Land Use Planning: Principles and Practices	4 Hrs.
ENS 504 Environmental Modeling with GIS	4 Hrs.
ENS 581 Environmental Policy	4 Hrs.
<i>Elective:</i>	8 Hrs.

Appropriate courses will be selected from within or without the environmental studies department in consultation with the student's adviser.

Environmental Humanities (28 Hrs.)

Emphasizes environmental history, literature, ethics, art, and philosophy.

Select 28 Hrs. from the following:

ENS 412 World Environmental Thought	4 Hrs.
ENS 418 American Environmental History	4 Hrs.
ENS 464 North America	4 Hrs.
ENS 474 Environmental Perception	4 Hrs.
ENS 476 Environmental Ethics: Science, Religion, and the Environment	4 Hrs.
ENS 477 Expressions of American Naturalism	4 Hrs.

ART 463	Modern Art History	4 Hrs.
ART 464	Contemporary Art History	4 Hrs.
HIS 439	American Agricultural History	4 Hrs.
HIS 442	American Urban History	4 Hrs.
HIS 505	Historic Environmental Preservation	4 Hrs.
HIS 511	Museum/Historic Sites Methods	4 Hrs.
PHI 432	Philosophy of Art	4 Hrs.
SOA 481	North American Indians: Culture and Ecology	4 Hrs.

An appropriate course or courses from other disciplines may be taken with the approval of the student's adviser.

CLOSURE REQUIREMENTS

M.A. candidates, with the assistance of their advisers and graduate committees, are required to develop a thesis or major graduate project. For many students, the culminating experience of graduate-level work is a formal thesis. Other 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, a laboratory research proj-

ect, or a finished and well-researched draft of environmental legislation or policy. The thesis or project is defended in an oral examination before the graduate committee.

Students must enroll in a total of four hours of master's closure exercise for credit; however, they may accrue the total in increments. After beginning a closure exercise, students are required by campus policy to be enrolled in at least one semester hour of closure exercise *each* semester until the exercise is completed. For environmental studies students, this means that if the closure exercise is not completed by the end of four credit hours of continuous enrollment, students must register to audit ENS 510 Thesis or ENS 520 Graduate Project (as applicable) for one credit hour in all subsequent semesters (except summers) until the exercise is completed.

STUDENT'S EDUCATIONAL PLAN

Development of an educational plan in a standard format is a key activity on which student and adviser work closely. The plan indicates the courses for the chosen concentration or area of study. The plan also includes a proposal for the thesis or graduate project. Students are expected to demonstrate how the plan is

appropriate for their backgrounds, aspirations, and needs. The department chair approves the plan. Amendments may be made during the course of study with the adviser's approval.

Graduate Committee: In consultation with the student, the graduate committee reviews the thesis or graduate project proposal and final product.

Variations and Waivers: Courses that the student wishes or needs to take are listed in the educational plan; variances sought from requirements must be indicated. Courses in other departments/programs that are not crosslisted or that have been taken at other institutions of higher education must also be listed. All variances must be approved by the adviser and department chair.

Internships: Environmental studies faculty believe that a period of time working in an environmental agency or organization can be a vital part of professional training. Students in the Graduate Public Service Internship program may count up to four hours of their special internship seminar, PAD 460, toward the internship.



GRADUATE CERTIFICATE IN ENVIRONMENTAL RISK ASSESSMENT

Risk assessment is a frequently used tool in environmental analysis. The graduate certificate in environmental risk assessment provides students with the professional education necessary to perform risk assessment operations in their agencies and industries. Students will also relate risk assessment methodologies, procedures, and results to environmental policies. To earn a certificate, students must complete the curriculum with a B average.

Students complete 16 credit hours for the certificate: ENS 421 Environmental Economics, ENS 521 Environmental Risk Assessment, ENS 522 Risk Assessment: Air, Land, and Water; and ENS 523 Risk Assessment Practicum.

ENVIRONMENTAL STUDIES MINOR FOR UNDERGRADUATES

Core

ENS 251 Introduction to Environmental Studies	4 Hrs.
BIO 371 Principles of Ecology	<u>4 Hrs.</u>
Total core	8 Hrs.

Electives

Select 8 hours from the following:

ENS 412 World Environmental Thought	4 Hrs.
ENS 418 American Environmental History	4 Hrs.
ENS 462 Environmental Physical Geography	4 Hrs.
ENS 463 Our Changing Climate	4 Hrs.
ENS 464 North America	4 Hrs.
ENS 465 Europe: A Continent in Change	4 Hrs.
ENS 468 Environmental Geology	4 Hrs.
ENS 474 Environmental Perception	4 Hrs.
ENS 477 Expressions of American Naturalism	<u>4 Hrs.</u>
Total	16 Hrs.

The department may approve up to eight semester hours of lower- and upper-division transfer credit.

COURSE DESCRIPTIONS

ENS 251 Introduction to Environmental Studies (4 Hrs.)

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.

SENIOR/GRADUATE

ENS 403 Transportation Problems and Planning Procedures (4 Hrs.)

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 Techniques of Environmental Planning: Remote Sensing and GIS (4 Hrs.)

Applications of remote sensing that apply to environmental planning are examined. Computer mapping procedures relevant to environmental planning are presented.

ENS 411 Introduction to Environmental Education (4 Hrs.)

Presents an overview of K-12 environmental education content and strategies for teaching K-12 students about the environment. Students will explore identification, evaluation, and application of instructional resources for K-12 environmental education.

ENS 412 World Environmental Thought (4 Hrs.)

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. See HIS 459.

ENS 418 American Environmental History (4 Hrs.)

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. See HIS 438.

ENS 419 Environmental Law (4 Hrs.)

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. See LES 419, POS 419, MPH 419.

ENS 421 Environmental Economics (4 Hrs.)

Basic theoretical tools necessary to examine current environmental problems from an economic standpoint. Covers externalities, cost assignment, and environmental problems associated with economic growth. See ECO 474.

ENS 432 Environmental Policy Analysis and Negotiation (4 Hrs.)

Presents policy-cycle models and stages of policy development. The specific characteristics of policy analysis and practical principles for policy analysis are described.

General roles of the analyst are considered. Policy processes are presented, and methods of analysis are studied. Case studies are used to illustrate typical policy issues. Negotiation processes are presented and applied.

ENS 444 Aquatic Ecology (4 Hrs.)

Fundamentals of freshwater ecology, including abiotic-biotic interactions, aquatic ecosystem structure and function, relationships among organisms. Lecture and lab. Prerequisite: Ecology. See BIO 444.

ENS 445 Biology of Water Pollution (4 Hrs.)

Effects of organic wastes, industrial chemicals, and non-point source pollutants on aquatic flora and fauna and humans. Laboratory involves detection and measurement of water pollution by toxicity testing and field sampling. See BIO 445.

ENS 447 Environmental Chemistry (4 Hrs.)

Use of chemical principles in understanding processes that occur in the environment. Ecological problems of a chemical nature are analyzed. See CHE 431.

ENS 449 Environmental Toxicology (4 Hrs.)

Study of effects of toxic chemicals on the environment. Included are sources, transport, chemical behavior, and toxic mechanisms of environmental pollutants. See CHE 465.

ENS 462 Environmental Physical Geography (4 Hrs.)

Physical elements of the landscape with attention to climate and weather, water balance, landforms, soils, and

vegetation. Interrelationships between environmental elements and influence on changing natural landscape and environmental problems.

ENS 463 Our Changing Climate (4 Hrs.)

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.

ENS 464 North America (4 Hrs.)

Cultural, economic, and physical patterns of North America with evaluation of regional characteristics and problems. Selected applications of regional planning techniques.

ENS 465 Europe: A Continent in Change (4 Hrs.)


Examines changing geographic and resource relationships. Special attention is given to supranational organizations such as NATO, Common Market, etc. Regional planning activities examined.

ENS 468 Environmental Geology (4 Hrs.)

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 474 Environmental Perception (4 Hrs.)

Study of perception and responses to natural environ-



ments. Analysis of the eye and other senses as perceptual systems: landscape interpretations; concepts of aesthetics; and environmental metaphors, images, and symbols.

ENS 476 Environmental Ethics: Science, Religion, and the Environment (4 Hrs.)

Explores the relationships between scientific concepts, religious teaching and beliefs and environmental issues and values. Topics include traditional religious views of nature; ecological theology; spiritual deep ecology; ecology, religion, and current political movements; science and religious beliefs; science and the supernatural; science and New Age movements; the role of science vs. religion in environmental ethics. A seminar/discussion format will be used.

ENS 477 Expressions of American Naturalism (4 Hrs.)

Historical and literary sources, with artistic representations, in chronological order, to uncover growth and change of American attitudes toward the natural environment. Selections from Jefferson, Cooper, Audubon, Emerson, Thoreau, Whitman, Cather, Sandburg, Frost, and others.

ENS 483 Environmental Policies: National Environmental Policy Act (4 Hrs.)

In-depth study of the environmental impact statement (EIS) process in the National Environmental Policy Act. Case studies analyzed; EIS on new projects researched and written.

ENS 484 Environmental Policies: Air Quality (4 Hrs.)

Clean Air Act and amendments and their effect on improving ambient air quality. Analysis of administrative procedures, standards, and regulations, as well as case studies.

ENS 485 Environmental Policies: Water Quality (4 Hrs.)

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

ENS 486 Solid and Hazardous Wastes: Technology and Policy (4 Hrs.)

Examines the nature of solid and hazardous wastes. Technologies, regulations, and enforcement techniques are studied and present and potential solutions are analyzed.

ENS 487 Natural Resources: Policy and Administration (4 Hrs.)

Review of the major natural resources such as water, energy, air, soil, forests, food, wilderness, wild plants, and animals. Includes an examination of the policies governing these resources and the administrative methods used in their governance. The primary focus will be on sustainable resource use. Each student will select a topic for an in-depth study. Seminar method used.

ENS 489 Pollution Prevention (4 Hrs.)

Continued environmental progress is becoming focused on preventing pollution as opposed to controlling pollu-

tion. This new approach changes the way in which people deal with environmental pollution. Basic principles and practices of pollution prevention are studied, as well as practical applications for business and consumers.

GRADUATE COURSES

ENS 501 Environmental Planning: Land and Resource Use (4 Hrs.)

Origins of environmental planning; methods of preparing environmental plans including analysis, formulation of land-use policies, design, and influences of institutional constraints.

ENS 502 Land Use Planning: Principles and Practices (4 Hrs.)

Examines procedures and methodologies for preparing land use plans. Analytical tools for evaluating land-use planning data are presented. Links between land use and transportation are examined.

ENS 504 Environmental Modeling with GIS (4 Hrs.)

Primary focus is on environmental modeling within a GIS setting. Planning problems and spatial analysis techniques are stressed. Course uses a lecture/lab/seminar format. Prerequisites: ENS 404 or ENS 555, or consent of instructor.

ENS 505 Historic Environmental Preservation (4 Hrs.)

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. See HIS 505.

ENS 521 Environmental Risk Assessment (4 Hrs.)

Introduction to the many aspects of risk assessment, the relationship between risk assessment and public policy and the perception of risk. Students will be expected to work out elementary problems in risk and exposure assessment. See MPH 527.

ENS 522 Risk Assessment: Air, Land, and Water (4 Hrs.)

Investigates risk assessment methodologies of terrestrial, waterborne, and airborne pollutants. Case studies, computer models, and extant data considered. Prerequisites: ENS 521 or permission of instructor.

ENS 523 Risk Assessment Practicum (4 Hrs.)

Subject matter to include identification and assessment of hazardous and toxic materials, site assessment, cleanup, and management strategies, and legal, policy, and economic applications in a real situation using extant data. This is the final course in the risk assessment sequence. Prerequisites: ENS 421, ENS 521, and ENS 522.

ENS 524 Environmental Decision Making (4 Hrs.)

Decision analysis techniques to accommodate uncer-

tainty. Decision models and computer techniques used to structure, make, and analyze decisions. Methods to model uncertainty presented. Environmental issues and policies emphasized. Strategies for creative problem solving and management under uncertainty developed.

ENS 525 Site Bioremediation/ Remediation (4 Hrs.)

Limitations and applicability of bioremediation/remediation as emerging and current technologies for rescuing contaminated soil and ground water. Processes are discussed in depth as are the distribution (phase partitioning) of contaminants into various subsurface compartments.

ENS 526 Risk Management and Communication (4 Hrs.)

Risk management decision and options. Public health, economic, ethical, social, and political consequences of decisions. Decision stakeholders, techniques of decision communication, and implementation of choices. Quality assurance and quality control tools.

ENS 527 Project Management (4 Hrs.)

A systematic approach to planning, scheduling, controlling, and evaluating projects of all sizes. Using decision theory, systems theory, and case studies to develop a total quality method to address all the elements of project management. Management of environmental projects is emphasized. Prerequisite: ENS 555 or permission of instructor.

ENS 540 Topics in Environmental Studies (1 to 4 Hrs.)

Intensive study of a current environmental issue. Description of topic for a given semester will be stated in the course schedule. Course may be repeated for an indefinite number of credit hours, but topics must differ.

ENS 546 Concepts of Ecology (4 Hrs.)

Structure and function of ecological systems, including basic ecological principles and concepts, habitat analysis with focus on populations in terrestrial and aquatic ecosystems, and collection and analysis of biological data. Laboratory work required.

ENS 547 Environmental Agriculture (4 Hrs.)


Examines the nature of U.S. farming and sustainable practices. Compares with current U.S. agricultural policy and potential future policies.

ENS 551 Environmental Natural Sciences (4 Hrs.)

Scientific knowledge required to understand and to solve environmental problems. Basic concepts of geology, 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 the Humanities (4 Hrs.)

Concepts and methods of anthropology, history, economics, political science, psychology, geography, and litera-



ture explored in integrative fashion. Focus on understanding processes, patterns, and alternatives of relationships of society to the biophysical world.

ENS 553 Seminar I (3 Hrs.)

Introduces students to a wide range of contemporary environmental topics and prepares students for independent research. Students will research several specific areas, prepare papers, and give oral presentations. Course focuses on improving the following skills: writing, research, verbal critical debate, critical thinking, editing, and group participation. Seminar style with extensive student participation. Students must take this course during their first year of graduate studies.

ENS 554 Seminar II (1 Hr.)

Assists students in developing a research proposal for their graduate theses or projects. Typical research designs and methodologies will be introduced and discussed. The student will be assisted in the selection of a thesis/project topic and an appropriate research design. Completion of a formal draft research proposal will be required. Program faculty will discuss their professional interests and current research projects. Seminar style, with extensive student participation. Students should take this course at the beginning of the second half of their graduate studies. Must be completed prior to, or taken concurrently with, ENS 510 or ENS 520. Prerequisite: ENS 553.

ENS 555 Analytical Tools for the Environmental Sciences (4 Hrs.)

Applied statistics and analytical techniques including

Monte Carlo simulation, linear programming, spreadsheets, best-fit, distribution models, decision trees, process models and simulations, and forecast applications. GIS technology and applications will be explored. Stresses extant data. Team taught by ENS faculty. Prerequisite: Graduate standing.

ENS 561 Foundations of Epidemiology (4 Hrs.)

Introduction to epidemiological concepts and methods. Considers the meaning and scope of epidemiology and the uses of morbidity, mortality, and other vital statistics data in the scientific appraisal of community health. See MPH 511.

ENS 562 Analytical Epidemiology (4 Hrs.)

Presents the fundamental concepts, principles, and methods of observational epidemiologic research. Practical issues in the design, conduct, and analysis of epidemiologic studies, as well as theoretical issues in the analysis and interpretation of research findings will be discussed. Intended for those interested in epidemiologic research. Prerequisite: ENS 561 or permission of instructor. See MPH 514.

ENS 571 The Sangamon River Valley: A Sense of Place (6 Hrs.)

In-depth study of natural and human histories of the Sangamon River Valley; extensive use made of local materials, resource people, and field experience. For elementary, middle, and high school teachers, teachers-in-training, and teachers-to-be.

ENS 581 Environmental Policy (4 Hrs.)

Examine environmental policy development and implementation. Uses integrative approaches to policy development and includes basic public policy theory. Seminar method used.

RESEARCH

ENS 500 Graduate Research (1 to 4 Hrs.)

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. degree.

ENS 510 Thesis (1 to 4 Hrs.)

Note: If the thesis is not completed by the time the initial four hours of continuous enrollment in ENS 510 are accumulated, students must register for one credit hour on an audit basis in *all* subsequent semesters until the thesis is completed.

ENS 520 Graduate Project (1 to 4 Hrs.)

Note: If the project is not completed by the time the initial four hours of continuous enrollment in ENS 520 are accumulated, students must register for one credit hour on an audit basis in *all* subsequent semesters until the project is completed.

ENS 530 Internship (1 to 4 Hrs.)