ENVIRONMENTAL STUDIES PROGRAM

Why study environmental studies?
The KU Environmental Studies Program provides a rigorous interdisciplinary education and stimulates exchange concerning the environment from natural science, social science, and humanities perspectives.

Undergraduate Programs
This interdisciplinary major gives students a fundamental knowledge of the human environment, the dimensions of human impact on the environment, and holistic approaches to solving problems resulting from this impact. The human environment includes all facets of human activity affecting the environment, such as philosophical and ethical issues, environmental resource use and misuse, population biology, and the chemistry of the atmosphere.

Electives
The goals of the program are
1. To provide a holistic view of the environment, one in which the synergistic nature of perturbations, natural and anthropogenic, can be understood and
2. To provide the technical and evaluative skills for active participation in an environmental career.

The environment is the central theme around which a liberal arts education is focused.

Students may declare an interest in environmental studies or a major in environmental studies by filling out the appropriate forms. CLAS Interest Code and Major Declaration forms are available from College Student Academic Services (http://clas.ku.edu/undergrad), 109 Strong Hall, or in the environmental studies office. Students are strongly encouraged to declare an environmental studies major as soon as possible.

Electives provide the opportunity to specialize, and these can be chosen by consulting the various pathways in the major (http://esp.ku.edu/pathways), which contain a list of faculty members associated with the pathway who are available to help decide on electives and environmental careers. An elective approval form must be submitted to 109 Strong Hall before a student is allowed to graduate. Forms may be obtained from the environmental studies office. Except for study abroad, a maximum of 8 hours of nonclassroom course work may be counted toward electives (e.g., internship or research).

Exceptions and Substitutions
All substitutions must be approved by a student’s environmental studies faculty advisor. A student must submit a requirement substitution form to the environmental studies faculty advisor. Forms can be obtained from the environmental studies office.

Internships
Internships allow majors to develop new skills and test their abilities and educational backgrounds. Students can assess their career objectives in professional settings. Internships are done in city, county, state, and federal agencies and in environmental organizations and private companies or agencies. Students are encouraged to participate at the end of the sophomore or junior year. Completion of an internship by the end of the junior year provides an opportunity to make career changes and final elective selections before the senior year. It is not possible to participate in an internship after graduation. The applicant must have a grade-point average of 2.5 or above, must have completed 12 hours of required environmental studies courses, and must have a suitable internship opportunity. A maximum of 3 hours may be applied to the 12 hours of required electives.

Professional Science Masters
The Professional Science Masters professional graduate degree is designed for graduates of bachelor’s programs in physical/natural sciences, environmental studies, civil/environmental engineering or related fields who are currently employed in private firms, public agencies, and not-for-profit organizations that address a range of environmental issues. Key foci in the science curriculum of this program are environmental impact assessment; soils, water, and ecosystems science; geospatial analysis; environmental health and policy; and an understanding of environmental law and policy and the regulatory environment.

The P.S.M. degree is a unique professional degree grounded in natural science, technology, engineering, mathematics and/or computational sciences and designed to prepare students for direct entry into a variety of career options in industry, business, government, or non-profit organizations. P.S.M. programs prepare graduates for high-level careers in science that have a strong emphasis on such skill areas as management, policy, entrepreneurship, communication and project management. P.S.M. programs consist of 2 years of academic training in an emerging or interdisciplinary area, along with a professional component that may include internships and "cross-training" in workplace skills.

Graduate Certificate in Environmental Studies
The Graduate Certificate in Environmental Studies is designed to give students already admitted to a graduate program at KU the opportunity for interdisciplinary coursework in Environmental Studies, spanning the humanities, natural/physical sciences, and social sciences.

Graduate Certificate in Environmental Assessment
The Certificate in Environmental Assessment is designed for graduates of bachelor’s programs in physical/natural sciences, environmental studies, civil/environmental engineering or related fields who are currently employed in private firms, public agencies, and not-for-profit organizations that address a range of environmental issues. Key foci in the science curriculum of this program are environmental impact assessment; soils, water, and ecosystems science; geospatial analysis; environmental health and policy; and an understanding of environmental law and policy and the regulatory environment.
Courses

EVRN 103. Environment and History. 3 Hours H.
Nature is our oldest home and newest challenge. This course surveys the environmental history of the earth from the extinction of the dinosaurs to the present with a focus on the changing ecological role of humans. It analyzes cases of ecological stability, compares cultural attitudes toward nature, and asks why this ancient relationship seems so troubled. (Same as HIST 103.) LEC.

EVRN 140. Global Environment I: The Discovery of Environmental Change. 5 Hours GE3N / U / LFE.
This interdisciplinary course and laboratory sections survey the foundations of environmental understanding and the process of scientific discovery from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics include the history of environmental systems and life on earth, the discovery of biotic evolution, ecological change, and climate change. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples. (Same as GEOG 140 and HIST 140.) LEC.

EVRN 142. Global Environment II: The Ecology of Human Civilization. 5 Hours GE3S / U.
This interdisciplinary course and its laboratory sections survey the history of humanity's relationship with the natural world over the long term from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics include the evolution of Homo sapiens and cultural systems; the development of hunter, gatherer, fisher, agricultural, and pastoral lifeways; the ecology of colonialism and industrial civilization, and the emergence of ideological and ethical perspectives on the relationship between nature and culture. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples. (Same as GEOG 142 and HIST 142.) LEC.

EVRN 144. Global Environment I: Discovery of Environmental Change, Honors. 5 Hours GE3N / U / LFE.
This interdisciplinary course surveys the foundations of environmental understanding and the process of scientific discovery from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics include the history of environmental systems and life on earth, the discovery of biotic evolution, ecological change, and climate change. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples. (Same as GEOG 144 and HIST 144.) Open only to students admitted to the University Honors Program or by permission of instructor. LEC.

EVRN 145. Global Environment II: The Ecology of Human Civilization, Honors. 5 Hours GE3S / U.
This interdisciplinary course and its laboratory sections survey the history of humanity's relationship with the natural world over the long term from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics will include the evolution of Homo sapiens and cultural systems; the development of hunter, gatherer, fisher, agricultural, and pastoral lifeways; the ecology of colonialism and industrial civilization, and the emergence of ideological and ethical perspectives on the relationship between nature and culture. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to the humanity's engagement with the global environment using historical and present-day examples. (Same as GEOG 145 and HIST 145.) Open only to students admitted to the University Honors Program or by permission of instructor. LEC.

EVRN 148. Scientific Principles of Environmental Studies. 3 Hours NB GE3N / N.
This course presents an overview of our understanding of environmental processes and issues. Topics include scientific principles, resource issues, pollution and global change, among others. This course gives students a rigorous understanding of interactions between humans and their environment and provides students with a scientific basis for making informed environmental decisions. (Same as GEOG 148.) LEC.

EVRN 149. Scientific Principles of Environmental Studies, Honors. 3 Hours NB GE3N / N / LFE.
This course presents an overview of our understanding of environmental processes and issues. Topics include scientific principles, resource issues, pollution and global change, among others. This course gives students a rigorous understanding of interactions between humans and their environment and provides students with a scientific basis for making informed environmental decisions. An honors section of EVRN 148, designed for superior students. (Same as GEOG 149.) Prerequisite: Membership in the University Honors Program or approval of instructor required. LEC.

EVRN 150. Environment, Culture and Society. 3 Hours SC GE3S / S.
An introduction to geographic approaches to the study of the environment, emphasizing societal and cultural factors that influence human interaction with the biosphere, hydrosphere, lithosphere and atmosphere. The course involves analysis of a broad range of contemporary environmental issues from the local to global scales. (Same as GEOG 150.) LEC.

EVRN 170. Introduction to Kansas Landscapes. 1 Hour N.
A course focused on the land and environment of Kansas. Field trips provide students with direct experience of the diverse landscapes in our area. Coursework also emphasizes the dynamic nature of the current landscape and the natural and cultural processes that have shaped it. LEC.

EVRN 171. Understanding Kansas Landscapes. 1 Hour N.
An introduction to the research methods used by scholars in diverse fields, applied to environmental issues introduced in EVRN 170. Prerequisite: EVRN 170. LEC.

EVRN 172. Kansas Landscape Projects. 1 Hour N.
Students participate in the design and execution of a simple research project focused on a local environmental topic. Prerequisite: EVRN 170, and EVRN 171. LEC.
EVRN 177. First Year Seminar: _____. 3 Hours GE11 / U.
A limited-enrollment, seminar course for first-time freshmen, addressing current issues in Environmental Studies. Course is designed to meet the critical thinking learning outcome of the KU Core. First-Year Seminar topics are coordinated and approved by the Office of First-Year Experience. Prerequisite: First-time freshman status. LEC.

EVRN 200. Study Abroad Topics In: _____. 1-6 Hours S.
This course is designed for the study of special topics in Environmental Studies. Coursework must be arranged through the Office of Study Abroad. May be repeated for credit if content varies. LEC.

EVRN 304. Environmental Conservation. 3 Hours NE GE3N / N.
A survey of current methods of describing and modeling the function, structure, and productivity of natural and anthropogenically modified earth resource systems, along with a discussion of contemporary views of what constitutes a natural landscape. Fundamental natural science principles about the interplay among lithospheric, atmospheric, hydrospheric, and biospheric components of earth systems are emphasized. Uses of natural resources, including fossil fuels, minerals, and water, are described with attention to the earth's total energy budget. Human activities that affect preservation, conservation, and multiple uses of earth regions receive attention. Systems under stress through population and other contemporary forces serve as examples. (Same as GEOG 304.) LEC.

EVRN 320. Environmental Policy Analysis. 3 Hours N.
An historical and analytical study of the formulation, implementation, and consequences of environmental policy in the United States. Attention will be directed at relevant interest groups, issues specific to both rural and urban populations, relationships between national policies and international organizations concerned with environmental problems. Prerequisite: EVRN 148/GEOG 148, and EVRN 103/HIST 103, EVRN 347/HIST 347 or EVRN 150/GEOG 150. LEC.

EVRN 332. Environmental Law. 3 Hours U.
An introduction to how the American legal process improves, transforms, and damages the natural environment. Emphasizes and compares shifting responsibilities of legal forces and institutions: judges and litigants, legislators and statutes, agencies and administrations, and citizens and regulated entities. Prerequisite: EVRN 148 and EVRN 103/HIST 103, EVRN 347/HIST347 or EVRN 150/GEOG 150. LEC.

EVRN 335. Introduction to Soil Geography. 4 Hours N / LFE.
The course focuses on the properties and processes of soils as they occur in their environment. The student is introduced to the nature of soil as it functions as a body; genesis of soils; properties of soil solids, especially colloids; soil chemical composition, properties, and reactions; interaction between solid, liquid, and gaseous components in soils; plant-soil-water relationships; biological interactions with soil; classification of soils; and the distribution of soils on the landscape. Not open to students who have taken GEOG 535 or EVRN 535. (Same as GEOG 335.) Prerequisite: GEOG 104 or GEOL 101 or consent of instructor; BIOL 100 and CHEM 130 or CHEM 190 recommended. LEC.

EVRN 336. Ethics, Ideas and Nature. 3 Hours AE51 / H.
This course examines the ethical frameworks developed for thinking about, using, and protecting the natural world. Examples of topics include indigenous approaches to nature, the history of ecological ideas, environmental movements, the role of the state in managing resources, utilitarianism and progressivism, environmental lawmaking, wilderness advocacy, nature and theology, the rights of nature, and environmental justice. Students are introduced to the theories of duty ethics, justice ethics, utilitarianism, and rights ethics, and required to apply ethical decision making to contemporary and historical environmental issues. Multiple perspectives on the history of human interactions with nature demonstrate the importance of reflecting upon the value systems inherent in human-centered environmental ethics and nature-centered environmental ethics. (Same as HIST 336.) LEC.

EVRN 338. Permaculture Design. 6 Hours N.
Students learn how a local, sustainable design system known as permaculture design creates an ecologically sound and economically viable way of living. The course consists of lecture, field, and practicum sessions. Lecture topics include food security, permaculture ethics, ecological principles, system design, sustainable soils, food production, food forests, earth works, and construction of human habitats. LEC.

EVRN 347. Environmental History of North America. 3 Hours H.
A survey of changes in the landscape and in people's perceptions of the natural world from 1500 to present. Topics include agroecology, water and energy, the impact of capitalism, industrialism, urbanization, and such technologies as the automobile and the origins of conservation. (Same as HIST 347.) LEC.

EVRN 363. Introduction to Environmental Hydrology and Water Resources. 3 Hours N.
Water is vital to life on earth. In this course we cover components of the water or "hydrologic" cycle, how management has altered them, and how they are predicted to change with the changing climate. We discuss the evolution of water policy, its implications for managements and the economic impact of human perturbation on water. We study the physical processes that govern the water cycle, learn how they are measured, and estimate hydrologic fluxes. (Same as GEOG 336.) Prerequisite: GEOG 104 or GEOL 101 or GEOL 102. LEC.

EVRN 371. Environmental Geopolitics. 3 Hours S.
This course examines how human relationships with the biophysical world are politicized. Examines key contributions to debates surrounding environmental security, resource conflicts, and related issues, as well as geopolitical assumptions on which these debates build. (Same as GEOG 371 and GIST 371.) LEC.

EVRN 385. Environmental Sociology. 3 Hours S.
This course invites students to study society and its impact on the environment. Environmental problems are social problems. This course will address such items as social paradigms, theories, inequalities, movements, and research. (Same as SOC 385.) LEC.

EVRN 405. Kansas Power. 3 Hours.
Where does our energy come from? How can we optimize our use of renewable and nonrenewable sources of energy? What are the drivers moving us to more renewable sources of energy? What are the impediments? In this course we will explore the use of fossil fuels, nuclear, wind, geothermal and solar energy in Kansas. We will visit nearby power plants, and alternative energy companies. Students will be expected to design an energy plan for a local entity, and present their ideas. Prerequisite: EVRN 140 and EVRN 142. LEC.
EVRN 410. Environmental Applications of Geographic Information Systems. 3 Hours N.
An introduction to the use, display, and analysis of spatial data. Students will
acquire a foundational skill-set in geographic information systems
and remote sensing using industry-standard GIS software and will apply
these skills using environmental data and case studies. Prerequisite:
EVRN 148 or EVRN 149 or GEOG 148 or GEOG 149; EVRN 103 or HIST
103, EVRN 150 or GEOG 150 or EVRN 347 or HIST 347. LEC.

EVRN 412. Ecology: Fundamentals and Applications. 3 Hours.
An introduction to the principles of ecology, with an emphasis on
environmental applications. Major topics include physiological and
functional ecology, population and community dynamics, biogeography,
and ecosystems ecology. Intended for students seeking B.A. or B.G.S.
degrees. Prerequisite: EVRN 140 or EVRN 144 or EVRN 148 or EVRN 149
or consent of the instructor. LEC.

EVRN 420. Topics in Environmental Studies: ______. 1-6 Hours N / LFE.
Courses on special topics in Environmental Science and/or Policy. These
courses may be lecture, discussions, or readings. Students may enroll in
more than one interest group but may enroll in a given interest group only
once. LEC.

EVRN 425. Global Water Scarcity. 3 Hours S.
Though natural factors are introduced, this course focuses primarily on
the human factors that contribute to global water scarcity. This course
also discusses the consequences of water scarcity and its effects on
society. Prerequisite: EVRN 148 or permission of instructor. LEC.

EVRN 433. Biogeography Field and Laboratory Techniques. 3 Hours N.
This course provides undergraduate students with practical experience
in field data collection techniques and laboratory data analysis methods.
During the first half of the semester, students work in the field using
a variety of methods to measure such vegetation characteristics as:
cover, density, biomass, leaf area, and canopy architecture. Students gain
experience in the use of field instruments including a spectroradiometer,
and techniques for quantifying biophysical attributes of vegetation.
During the later part of the course, students learn to summarize their field
data and examine relationships between the vegetation attributes and
measurements made using remote sensing instruments. Recommended:
GEOG 316 or an introductory statistics equivalent. (Same as GEOG 433.)
FLD.

EVRN 460. Field Ecology. 3 Hours N / LFE.
An introduction to research methods for environmental science. The
course includes fieldwork in diverse ecosystems (lakes, streams, forests,
prairies). It emphasizes the development of skills in data analysis and
interpretation that are essential to a full understanding of environmental
issues. Enrollment limited to environmental studies majors, or by
instructor permission. Prerequisite: Junior or Senior standing, completion
of the natural sciences requirement of the KU Core (GE3N), and either
EVRN 320 or EVRN 332. FLD.

EVRN 490. Internship in Environmental Studies. 1-8 Hours AE61 / N.
Supervised practical experience in a specific environmental area
of interest. The advisor will schedule regular meetings to evaluate
progress and provide assistance. A written summary of the internship
experience and evaluation will be prepared independently by the student,
a representative of the cooperating agency, and the advisor. Total credit
may not exceed 8 hours. Prerequisite: Junior standing and consent of
program director. Restricted to declared Environmental Studies majors.
Restricted to students with a 2.5 overall GPA or above. INT.

EVRN 510. Advanced Environmental Applications in Geospatial
Techniques. 3 Hours H/N.
This course focuses on applying advanced geospatial mapping and
analysis techniques to "real-world" environmental issues. Course
content may include lecture/lab time on advanced geospatial topics; a
major class project, small-group projects, or individual projects; or half-
semester internships with state agencies or campus entities that will
culminate in an individual project. The specific nature of projects will be
driven largely by student interest and ability, as well as agency:center
needs. Prerequisite: EVRN 410 or equivalent course; or permission of the
instructor. LEC.

EVRN 519. Sociology of Global Food. 5 Hours U.
The Sociology of Global Food offers a critical examination of the
global food system since the Industrial Revolution. Topics include the
industrialization of agriculture, sustainable agriculture, and the role of
food in agriculture in organizing society. This course discusses the
emergence of current debates around food and agriculture including food
activism, technological developments, human/environment relationships,
and labor issues. There is a lab component to this course. (Same as SOC
519.) Prerequisite: Junior standing. LEC.

EVRN 526. Remote Sensing of the Environment I. 4 Hours N.
Introduction to study of the environment through air photos and
satellite imagery, including principles of remote sensing, interactions of
electromagnetic energy with the atmosphere and earth's surface, aerial
photography, satellite systems, and sensors (electro-optical, thermal, and
radar). Emphasis in the latter part of the course is on such applications
as global monitoring, land cover mapping, forestry, agriculture, and
oceanography. Laboratory emphasizes visual interpretation of aerial
photography and satellite imagery and an introduction to digital image
processing in the department's NASA Earth Science Remote Sensing
Laboratory. (Same as GEOG 526.) Prerequisite: MATH 101 or equivalent.
GEOG 358 recommended. LEC.

EVRN 528. Environmental Justice and Public Policy. 3 Hours S.
This course provides an overview of environmental justice, both as a
social movement and as a public policy initiative. Environmental justice
examines the distribution of environmental externalities across different
socio-economic and racial groups. We will discuss several different
public policy areas that have been impacted by the environmental justice
movement: hazardous waste facility siting, urban redevelopment and
Brownfields, transportation policy, and Native American sovereignty.
We will also touch upon international environmental policy in an
environmental justice context. Throughout the course we will evaluate
empirical issues in studying environmental justice. (Same as POLS 528.)
Prerequisite: POLS 306, or a statistics class, or consent of instructor.
LEC.

EVRN 530. Biodiversity Discovery and Assessment. 2 Hours N.
An integrated lecture and laboratory course designed to provide an
overview of modern methods in biodiversity exploration and discovery.
Lectures cover the theory and practice of planning fieldwork in remote
locations, documenting species and their natural history, how museum
collections are made, calculating and comparing species richness
estimates, and the process of describing and naming new species. The
laboratory component provides students experience in documenting
species and their natural history, processing and curating samples of
natural history specimens, and the statistical analysis of biodiversity
data. (Same as BIOL 530.) Prerequisite: BIOL 152, 153, or equivalent, or
permission of instructor. LEC.
EVRN 531. Tropical Fieldwork in Biodiversity Discovery. 1 Hour U.
An introduction to modern field methods of assessing biodiversity. Fieldwork employs a variety of methods to study and compare species diversity between different habitats and field sites. Taught at different sites in tropical South America over Spring Break. Contact Undergraduate Biology, or the Office of Study Abroad. (Same as BIOL 531.) Prerequisite: BIOL 152, 153, or equivalent, or permission of instructor. Concurrent or prior enrollment of BIOL 530 is strongly encouraged. LAB.

EVRN 535. Soil Geography. 5 Hours N / LFE.
A broad study of the principles and properties of soils and their distribution on the landscape. Topics covered include: pedology, clay mineralogy, soil physics, soil chemistry, management of soils, soil biology, taxonomy, and soil geomorphology. Laboratory section and a field project are required. Not open to students who have taken GEOG 335 or EVRN 335. (Same as GEOG 535.) Prerequisite: GEOG 104 or GEOG 101 or consent of the instructor; BIOL 100 and CHEM 130 or CHEM 190 recommended. LEC.

EVRN 538. Soil Chemistry. 3 Hours N / LFE.
This course examines the chemical properties and processes of soils and methods of evaluation. Topics include solid solution speciation, mineral solubility, soil colloidal behavior, ion exchange, surface complexation, soil salinity and sodicity, soil acidity, oxidation-reduction reactions, and kinetics of soil chemical processes. (Same as GEOG 538.) Prerequisite: GEOG 335 or GEOG 535 or EVRN 335 or EVRN 535, CHEM 135 or CHEM 195, MATH 125, or consent of the instructor. LEC.

EVRN 540. Ecohydrology. 3 Hours N.
Ecohydrology is the discipline that answers real world hydrologic and biologic questions through integrating knowledge from hydrology, ecology, atmospheric science and biogeochemistry. We focus on the key concepts, methodological approaches and analytical techniques utilized in ecohydrology to understand and quantify: plant water use, evolution of hydrologic properties, groundwater-surface water interactions, controls on landscape patterns, spatial and temporal patterns of soil moisture and nutrient concentrations, and vegetation competition. Students should leave the class having developed critical skills in: 1) reviewing scientific literature, 2) collecting environmental samples, 3) analyzing ecohydrologic data, 4) writing a scientific research paper, 5) working collaboratively and independently. (Same as GEOG 540.) Prerequisite: GEOG 104 or GEOG 101 or GEOG 102, or EVRN 363 or GEOG 336 or permission of instructor. LEC.

EVRN 542. Ethnobotany. 3 Hours S.
Course will involve lectures and discussion of Ethnobotany - the mutual relationship between plants and traditional people. Research from both the field of anthropology and botany will be incorporated in this course to study the cultural significance of plant materials. The course has 7 main areas of focus: 1) Methods in Ethnobotanical Study; 2) Traditional Botanical Knowledge - knowledge systems, ethnolinguistics; 3) Edible and Medicinal Plants of North America (focus on North American Indians); 4) Traditional Phytochemistry - how traditional people made use of chemical substances; 5) Understanding Traditional Plant Use and Management; 6) Applied Ethnobotany; 7) Ethnobotany in Sustainable Development (focus on medicinal plant exploration by pharmaceutical companies in Latin America). (Same as ANTH 582.) Prerequisite: ANTH 104, ANTH 108, EVRN 148, or consent of instructor. LEC.

EVRN 550. Environmental Economics. 3 Hours U.
This course provides an overview of the theory and empirical practice of economic analysis as it applies to environmental issues. Topics include externalities (a type of market failure), the valuation of nonmarket goods, the practice of benefit-cost analysis, and the efficiency and cost effectiveness of pollution control policies. Most importantly, the course permits students to perform economic field research, using state-of-the-art techniques in a manner accessible to undergraduate students. (Same as ECON 550.) Prerequisite: ECON 104, ECON 140, or ECON 142. LEC.

EVRN 553. Comparative Environmental Politics. 3 Hours S.
This course compares environmental politics and policies across a number of countries, including those in North America, Western Europe, East Asia, and Latin America. (Same as POLS 553.) LEC.

EVRN 556. United States Environmental History in the 20th Century. 3 Hours H.
Americans dramatically changed the natural world between 1900 and 2000. This course asks how transformed environments shaped the American experience during a century of technological innovation, democratic renewal, economic expansion, global conflict, and cultural pluralism. Topics include food and markets, energy and transportation, law and politics, protest and resistance, suburbanization, and environmentalism’s fate in a global information era. (Same as HIST 562.) LEC.

EVRN 563. U.S. Environmental Thought in the 20th Century. 3 Hours H.
Explores both leading and dissident ideas that Americans have had about the natural world since 1900. Broad chronological periods are explored in some depth, including the Progressive Era, New Deal, Cold War, the Sixties, and the Reagan Eighties. The course uses articles and books, as well as visual and aural forms of communication. Commercial speech, as well as scholarly and literary works, are considered. (Same as HIST 563.) Prerequisite: EVRN 148 or HIST 129, or by permission of instructor. LEC.

EVRN 611. Water Quality, Land Use, and Watershed Ecosystems. 3 Hours N.
Water quality issues are integrated with land use planning and the development of watershed management strategies. Interrelationships among the hydrologic cycle, atmospheric deposition, nutrient transformations and pesticide use are examined in regards to stream, lake, and groundwater quality. Prerequisite: CHEM 110 or CHEM 130 and BIOL 414, or consent of instructor. LEC.

EVRN 615. Capstone Project. 3 Hours AE61 / N.
The capstone project provides students with a broad-based, interdisciplinary educational experience and allows them to integrate and synthesize the knowledge they have gained in their environmental studies major. It rejoins the cohort that has separately pursued the BA/BGS and BS tracks and places them in situations in which they address real world environmental issues with a team approach and produce professionally meaningful analytical reports. Prerequisite: Junior standing; EVRN 320, EVRN 332, and EVRN 460. Restricted to declared Environmental Studies majors. LEC.

EVRN 616. Environmental Impact Assessment. 3 Hours N.
This course provides an overview of environmental laws and regulations. Additional focus is given to the process described in the National Environmental Policy Act (NEPA). Students will learn when NEPA is triggered, the difference between Environmental Impact Statements (EIS) and Environmental Assessments (EIA), and how to write an EIS/EIA. Prerequisite: An introductory course in environmental law, or consent of instructor. LEC.
EVRN 620. Environmental Politics and Policy. 3 Hours S.
Analysis of environmental politics and the formulation and implementation of environmental policy. Examines the history and development of environmental politics as well as current trends. Themes include interest groups, business interests, political institutions, and specific environmental policy issues. (Same as POLS 624.) LEC.

EVRN 624. Independent Study. 1-9 Hours AE61 / N.
A research course, in any of the fields of environmental studies, consisting of either experimental research, original policy analysis, or the preparation of an extensive paper based on library investigation. Project topic to be agreed upon in advance with supervising faculty member. Prerequisite: Consent of instructor. IND.

EVRN 625. Honors Research in Environmental Studies. 3 Hours AE61 / N.
A course giving eligible majors the opportunity to earn Departmental Honors by engaging in an intensive program of study leading to an original piece of research. Prerequisite: Senior standing, approval of the Environmental Studies Program, the Honors Project Director, and an overall 3.25 cumulative grade point average during the semester of enrollment. Restricted to declared Environmental Studies majors. IND.

EVRN 628. The Politics of Public Health. 3 Hours S.
This course examines the social, institutional and political context of public health policy in the United States. We will examine factors that shape the nation’s public health, explore the role of government in reducing risk and promoting well being, and analyze the major institutions responsible for monitoring, protecting and promoting general public health. Themes include the social determinants of health, health disparities, emerging infectious diseases, food safety, transportation, and environmental health. (Same as POLS 628.) Prerequisite: POLS 110 and POLS 306 are recommended. LEC.

EVRN 635. Soil Physics. 3 Hours N.
Provides theoretical and practical foundations for understanding physical properties and processes of variably-saturated porous media. Focus is on the transport, retention, and transformation of water, heat, gas, and solutes through the soil. We examine modern vadose zone measurement methods, analytical tools, and numerical models for data collection and interpretation. (Same as GEOG 635.) Prerequisite: GEOG 335 or EVRN 335; or GEOG 535 or EVRN 535, and MATH 125, PHSX 114; or consent of instructor. LEC.

EVRN 636. Globalization and Environment. 3 Hours.
The focus is on the sociological facets of global environmental problems (e.g., climate change, biodiversity, fresh water problems, toxic waste; invasive species) and especially their relationship to globalization, growth, and what environmental sociologists have called the "human exemptionalist model.” We address global environmental problems, political divisions over them, environmental movements and justice, and adaptation and mitigation strategies. The sociological literature on these issues and different environmental social theories are discussed (e.g., ecological modernization, treadmill theory, metabolic rift). Special attention is given to the impact of globalization and expansion of the global economy relative to the biosphere and consequent spikes in the consumption of resources and production waste. (Same as SOC 635.) Prerequisite: SOC 104 or EVRN 103 or EVRN 140 or permission of the instructor. LEC.

EVRN 656. Ecosystem Ecology. 3 Hours N.
An introduction to the patterns and processes that affect terrestrial ecosystems. Emphasis is placed on understanding nutrient cycles (e.g., carbon nitrogen phosphorous), hydrologic cycles, and patterns of net primary productivity. The role of both natural and anthropogenic disturbances in structuring terrestrial ecosystems is examined in the context of global land-use patterns. Discussion of current research literature will be expected. (Same as BIOL 656.) Prerequisite: BIOL 414 and CHEM 130. LEC.

EVRN 673. Environmental Justice. 3 Hours NW / U.
An examination of the impact of environmental justice and security in Indigenous communities throughout the world with a focus on tactics and strategies that incorporate Indigenous perspectives in responses and mitigation schemes. A survey of mining, dumping, and storage of toxic and radioactive waste activities as related to Indigenous peoples. Case study analyses of economic, military and mining interests contrasted with perspectives emerging from cultural traditions and beliefs of Indigenous peoples and communities. (Same as ISP 673.) Prerequisite: Permission of instructor. LEC.

EVRN 701. Climate Change, Ecological Change and Social Change. 3 Hours.
This interdisciplinary graduate seminar examines the role of climate change, its impact on natural and human systems, and how these understandings have changed over time. SEM.

EVRN 702. Energy, Ecology and Community in Kansas. 3 Hours.
This interdisciplinary graduate seminar examines the role of climate change and energy production in shaping energy, ecology, and community in Kansas from natural and physical science, social science, and humanities perspectives. The class explores the ways that different disciplines approach understanding climate change and its impact on natural and human systems and how these understandings have changed over time. The course is team-taught by faculty from the natural and physical sciences, social sciences, humanities, and professional schools, and will include faculty guest speakers from KU and off-campus. Students will write a research paper on a climate change topic of their choice that reflects the historical and interdisciplinary approaches of the seminar. A goal of the seminar is to assemble student papers for presentation and possible publication. Prerequisite: Consent of instructor. LEC.

EVRN 720. Topics in Environmental Studies: _____. 1-6 Hours.
Courses on special topics in Environmental Studies. These courses may be lecture, seminars, or readings. Students may enroll in more than one interest group but may enroll in a given interest group only once. LEC.
EVRN 721. Environmental Regulation and Policy. 3 Hours.
This course provides a survey of the environmental regulations, environmental problems, and environmental solutions that must be dealt with by environmental scientists in agencies and industry. Considers both theoretical and practical/applied aspects of environmental practices. LEC.

EVRN 725. Environmental Security. 3 Hours.
This course examines environmental issues, concerns, and policy as they relate to security through the framework of geopolitics. National security and conflict are increasingly discussed in relation to the environment, such as concerns regarding environmental change as well as stresses and demands on natural resources, e.g., water, energy, deforestation, desertification. The course will examine key contributions to the environmental security, resource conflicts, climate security and related literatures. LEC.

EVRN 730. Environmental Toxicology. 3 Hours.
Examines the effects of toxic chemicals on individuals, populations, communities and ecosystems. Topics include major classes of pollutants, movement, distribution and fate of pollutants in the environment, mechanisms of action, toxicity testing, and environmental assessment. LEC.

EVRN 735. Scientific Communication. 3 Hours.
Principles of English communication skills for the professional scientist. The course begins by exploring the role of narrative in all forms of scientific communication; it then applies the use of narrative tools to scientific writing, message honing and speaking. The course covers written and verbal communication of primary research. Students must have an independent research project on which to focus their communication assignments. (Same as BIOL 735.) LEC.

EVRN 740. Soil Science for Environmental Assessment. 3 Hours.
Provides students with a solid understanding of soils in the environment, particularly as it relates to environmental assessment. Topics include soil geomorphology, soil physics/chemistry/biology, management of soils, and soil contaminants. Prerequisite: CHEM 130 or CHEM 190 recommended or consent of the instructor. LEC.

EVRN 745. Environmental Data Analysis and Statistics. 3 Hours.
Survey of common statistical methods for analyzing environmental data. Includes techniques for environmental monitoring, impact assessment, and site reclamation, as well as methods for handling censored data, time series, and spatial analysis. Sampling design, data interpretation, and presentation of statistical results will be emphasized. Prior coursework or practical experience in statistics is expected. Prerequisite: Permission of instructor. LEC.

EVRN 750. Environmental Air Quality Assessment. 3 Hours.
Addresses scientific, regulatory, and technical aspects of air quality monitoring, including pollutant formation and dispersion, pollution control, national emissions standards, and methods for monitoring pollutants and air quality. Prerequisite: CHEM 130 or CHEM 190 recommended or consent of the instructor. LEC.

EVRN 771. Project Management for Science Managers. 2 Hours.
Students will learn to use current project planning tools to develop project plans that aid in bringing a project to completion on time and within budget. They will demonstrate the ability to manage projects within a science organization. LEC.

EVRN 772. Organizational Management for Science Managers. 2 Hours.
Explores concepts and practices in leadership, organizational behavior and change management. Emphasis is placed on understanding dynamics of individuals and groups in organizational structures focused on research and innovation. Students will tackle organizational culture, management approaches, performance-building, and creativity and innovation management in science organizations. LEC.

EVRN 773. Management of People in Science Organizations. 2 Hours.
Explores the duties and responsibilities of a scientist placed in a supervisor/manager role. Addresses management of scientists and technicians as part of an integrated team, conflict management, recruitment and interviewing, professional development of employees, performance management, and an overview of human resources law and compliance. LEC.

EVRN 774. Financial Management in Science Organizations. 2 Hours.
The goal of this course is to gain an understanding of finance, budget, and accounting in a science organization. The student will learn how to interpret and understand basic financial statements; how to make good decisions based on them; learn essential accounting concepts and characteristics of accounting systems; and budgeting/forecasting in a science-based organization. LEC.

EVRN 775. Organizational Communication for Science Managers. 2 Hours.
Addresses challenges and approaches of communicating science concepts and results to technical and non-technical as well as internal and external audiences. Focuses on techniques to improve the effectiveness of written and oral communication, including technical writing of project and research proposals, scientific presentations, and effective workplace communications. LEC.

EVRN 776. Law, Ethics, and Intellectual Property for Science Managers. 2 Hours.
This course provides an overview of basic patent law, the patent process, patent interpretation (claims and prior art) and intellectual property law in science. It addresses elements of employment and business law for managers, regulatory standards, and codes of conduct/professional standards/ethics in a science organization. LEC.

EVRN 777. Professional Development for Science Managers. 1 Hour.
Addresses professional development of the scientist as managers. Students will develop a personal and professional development plan and understand how to apply it to their own professional career, future career transitions, and lifelong career progression. LEC.

EVRN 778. Topics in Science and Technical Management. 1-3 Hours.
Addresses special topics in Science Management. Students may enroll in more than one interest group but may enroll in a given interest group only once. LEC.

EVRN 815. Professional Science Masters Capstone. 1-3 Hours.
A culminating experience to develop a workforce project and produce a written report to be presented orally to a committee that includes an industry member. Students will develop an applied workforce project in the student’s place of employment for full time employees or an internship for full time students. The students will document their project in a written report and present their project to the Environmental Studies faculty (2), and the student’s employer or representative if practical. Prerequisite: Minimum 20 credit hours completed in program. LEC.
EVRN 915. Capstone. 3 Hours.
The goal of this research seminar is to discuss individual students’ research, culminating in the completion of a paper in Environmental Studies for presentation at a professional meeting and/or publication in a professional journal. SEM.