Spring 2018 Environmental Studies Program Updates

Minor in Environmental Analysis

- ***Deep training**: Courses in analysis, critical thinking, and problem solving*
- ***Accessible:** Most courses do not have pre-requisites**
- ***Application and problem solving:** Many opportunities for interdisciplinary, collaborative, project-based, and community-engaged learning*
- *Pairs well with disciplinary-based majors to provide interdisciplinary, applied experiences that can be leveraged for career and job preparation*

This minor was developed to prepare students to tackle real-world environmental challenges by providing more robust opportunities for interdisciplinary knowledge and skill development. The minor is structured to provide students with opportunities to strengthen their critical analysis and problem-solving skills through participation in team-based, experiential, often community-engaged learning around "wicked" real-world problems. Most courses do not have pre-requisites.*

Required Courses
ENST 350W: Environmental Writing (Every Spring)
ENST 357: Environmental Problem Solving (Every Spring)
ENST 380: Introduction to GIS (Every Semester)

One Interdisciplinary Project-Based Capstone Course
ENST 405: Sustainability Exchange (Every Semester)
ENST 406: Urban Ecosystem Principles Integration (Every Fall)
ENST 452: International Climate Negotiation Seminar (Every Fall)
ENST 539: Interdisciplinary Environmental Clinic (Every Semester)

One Advanced Elective in Natural Science
ENST 364: Field Methods for Environmental Science (Every Fall)
ENST 365: Applied Conservation Biology (Every Spring)
ENST 481: Advanced GIS (Every Semester)*
EPSC 454: Exploration and Environmental Geophysics (Every Fall)*

One Advanced Elective in Social Science and Humanities
ECON 451: Environmental Policy (Every Fall)*
ECON 461: Intro to Environmental Law and Policy (Every Fall)
ENST 310: Ecological Economics (Every Spring)
ENST 315: Fallout: Analyzing Texts & Narratives of the Nuclear Era (Every Spring)
ENST 335: Environmental Ethics (Every Semester)
HIST 3068: Human History of Climate Change (Every 1-2 years, SP18)
POLSCI 4043: Public Policy Analysis (Every Year)

**Pre-reqs: ENST 481 (ENST 380); EPSC 454 (EPSC 201); ECON451 (ECON 1011)*

Minor in Environmental Studies

- ***Exposure**: Includes introductory-level courses*
- ***Accessible:** because it includes introductory courses*
- ***Flexible:** Wide degree of choice in elective categories*
- *Pairs easily with many majors to provide interdisciplinary exposure*
- *Recall, if a student has a major and a minor, the upper-level (300+) units for the major and minor must be independent of one another*

Required Core Courses
BIO 2950: Introduction to Environmental Biology
EPSC 201: Earth and Environment
POLSCI 2010: Introduction to Environmental Policy

One advanced science course
BIOL 372: Behavioral Ecology
BIOL 381: Intro to Ecology
ENST 364: Field Methods for Environmental Science
ENST 365: Applied Conservation Biology
ENST 375: Urban Ecology
EPSC 323: Biogeochemistry
EPSC 401: Earth Systems Science
EPSC 413: Introduction to Soil Science

One advanced political science or law course
ENST 461: Introduction to Environmental Law and Policy
POLSCI 3240: Political Economy of Public Goods
POLSCI 331: Topics: Theories of justice
POLSCI 332: Environmental and Energy Issues
POLSCI 3752: Topics: Globalization, Urbanization, and the Environment
POLSCI 4043: Policy Evaluation

One advanced anthropology or ethics course
ANTH 3053: Nomadic Strategies and Extreme Ecologies
ANTH 3322: Brave New Crops
ANTH 3472: Global Energy and the American Dream
ANTH 361: Culture and Environment
ANTH 4211: People and Plants: Paleoethnobotany and Ethnobotany
PHIL 335F: Introduction to Environmental Ethics

Other advanced courses pre-approved for substitution
ENST 405: Sustainability Exchange
ENST 452: International Climate Negotiation Seminar
See website for other courses that are pre-approved substitutions

UNIQUE COURSES WITH FIELD EXPERIENCES FOR FIRST YEAR STUDENTS

ENST 122: A Sense of Place: Discovering the Environment of St. Louis (Every Fall, Martin) Through exploration in and around St Louis rivers, prairies, and urban landscapes, students learn about their "home" for the next four years. Through field trips, readings, interviews and discussion, students see first-hand what challenges face the environment and the people who live here, and why it is important to understand the community at a local level.

ENST 215: Introduction to Environmental Humanities *NEW IN FA18* (Every Fall, Loui) In this seminar we will consider texts illustrating how American citizens evolved in their perception, use, and expectations of the natural world during the nineteenth and early twentieth centuries, especially but not limited to the practice of agriculture. Topics will include: agrarian democracy; settlement of the Great Plains by immigrant farmers; the Dust Bowl; fragmentation of the Sioux ecosystem. This cultural research will frame our visits to the Tyson Research Center. ***First and second year students only.***

BIOL 1181: First-Year Opportunity: Research and Conservation in Zoos and Botanical Garden *NEW IN FA18* (Every Fall, Losos) An introduction to the world of zoos and botanical gardens. Students will learn of the diverse and cutting-edge ways in which scientists and conservationists study the world's biological diversity and work to conserve it. Students will take weekly field trips to local institutions to hear how researchers conduct conservation science.

BIOL 2431/2: Missouri's Natural Heritage (Every Fall/Spring, Braude) Missouri's Natural Heritage is for freshmen who want to get outdoors and learn about their home for the next four years. The first semester of the sequence will focus on Missouri geology, climate, archaeology, and native megafauna. This will provide a foundation on which to examine the ecology, restoration, and management of our diverse habitats (prairie, forest, glade, and stream) and the biology of our diverse plant and animal wildlife (arthropods, mollusks, fish, salamanders, lizards, birds, and mammals).

INTRODUCTORY LEVEL COURSES FOR NON-MAJORS

I50 INTER D 101: Earth's Future: Causes and Consequences of Global Climate Change (Every Fall) This course examines the physical basis for climate change, how climates are changing and how we know and assess that climates are changing, and the effects of climate change on natural and human systems. This is a broad, introductory course for first year students and presumes no special subject matter knowledge.

ENST 105: Sustainability in Business (Every Spring, Webb). In this course, we explore key concepts, debates, and issues driving sustainability in business. We will also look at various sustainability tools, principles, and frameworks that business can use to better understand the natural systems from which sustainability is derived and upon which all organisms and organizations rely to sustain their own existence.

ENST 110: Environmental Issues (Every Fall, Parks) This course examines the science behind current environmental issues, with emphasis on Earth Science. Students will gain an understanding about the consequences of the way that humans currently interact with the natural environment and potential solutions that would allow long-term sustainability of the Earth.

ENST 115: Introduction to Conservation Biology (Every Spring, Parks) The purpose of this class is to help create citizen stewards for our natural environment. By helping students to better understand our natural biological world and the importance of the issues facing it, students are empowered to become active participants in environmental protection and awareness as citizens, voters, volunteers, and even in potential professional applications.

INTRODUCTORY COURSES FOR MAJORS AND MINORS

ENST 250: One Health Linking the Health of Humans, Animals, and the Environment *NEW IN FA18* (Every Fall, Deem and Adalsteinsson) This course is an introduction to One Health, a collaborative effort of scholars and practitioners in human medicine, veterinary medicine, epidemiology, ecology, and sociology, among others, working to attain optimal health for people, animals, and the environment. Students will learn about challenges threatening environmental, animal, and human health and the holistic, transdisciplinary approach necessary to develop solutions. ***First and second year students only.***

BIO 2950: Introduction to Environmental Biology (Every Fall, Pardini) This active-learning course teaches principles of environmental biology and general science literacy skills. Four main topics (human population growth, ecosystem carbon and energy, biodiversity, sustainable agriculture) are covered through exploration around the central question, "How can we feed a growing human population and conserve biodiversity without destroying the planet?"

POLSCI 2010: Introduction to Environmental Policy (Every Semester, Krummenacher) This course provides an introduction to and overview of environmental policy. Subjects covered include the policy process, the behavior of interest groups and political parties, and the actions of policymakers like Congress and the President. We'll also examine issues such as pollution control, climate change, and biodiversity.

EPSC 201: Earth and the Environment (Every Semester, Various) Introduction to the study of the Earth as a dynamic, evolving planet. Emphasis on how internal and surface processes combine to shape the environment. Themes: Earth's interior as revealed by seismic waves; Earth history and global tectonics shown by changes to ocean floors, mountain-building, formation of continents, earthquakes, and volcanism; climate history and global biogeochemical cycles, influenced by circulation of atmosphere and oceans, ice ages, and human activity. Composition and structure of rocks and minerals.

ENST 290: Sophomore Seminar in Sustainability and the Environment (Every Fall, Parks) This course will provide an opportunity for students to evaluate and explore potential paths in environmental studies, and learn presentation skills to carry forward in their careers.

TOPICAL ELECTIVE COURSES

POLSCI 340: Topics in Politics: Environmental Justice (Every Spring, Krummenacher) This course explores the history and foundations of the environmental justice movement along with current issues and methods of analysis. Policy responses to environmental injustices will be discussed and the claims of injustices evaluated. Students will work with a community based organization in the St. Louis region to explore a local case of environmental justice.

POLSCI 3752: Topics in American Politics: Globalization, Urbanization, & the Environment (Every Fall, Krummenacher) The rapid spread of urbanization has profound consequences for environmental quality. This course explores the causes and consequences of urbanization on environmental health and how local environmental conditions may facilitate the growth of modern mega-cities. Topics include effects of demographic changes on rural communities as young people seek opportunity in cities and the benefits to environmental quality from an expanding middle class.

ENST 461: Introduction to Environmental Law and Policy (Every Fall, Hubertz) Survey of the most prominent federal laws governing environmental compliance and pollution control. Examines laws applicable to environmental impact statements, air pollution, water pollution, and hazardous waste. Addresses policy concerning the relative merits of using technological capabilities as compared with health risks in setting environmental standards. Discusses the need for environmental regulation to protect societal resources.

ENST 402: Topics in Environmental Science: International Energy Politics ***NEW IN FA18*** (Every Fall, Retting) This course analyzes long-term political, economic and security trends in the international energy markets (oil, natural gas, coal, nuclear, wind and solar). It examines the effects of energy resources on peace and conflict, on the stability and well-being of democracies and dictatorships, and on the domestic and foreign politics of the United States, the European Union, Russia, Saudi Arabia, Iran, Iraq, Nigeria and Venezuela.

ENST 3615: Environmental Anthropology (Every Spring, O'Leary) This course will provide students with a working knowledge of how the study of humans across space and time has fundamentally impacted the way we understand the idea of nature, the environment and what it means to be human. The course will ground students in both historical and cutting-edge anthropological theories with units on subsistence, transformative nature, imagining wilds in the Anthropocene and pluralizing environmentalisms.

ENST 380/580: Applications in GIS (Every Semester, DeMatteo) This introductory course in Geographic Information Systems (GIS) is designed to provide basic knowledge of GIS theory and applications using the existing state-of-the-art GIS software. The first weeks of the course will provide a broad view of how you can display and query spatial data and produce map products. The remainder of the course will focus on applying spatial analytical tools to address questions and solve problems. Students complete a final independent project that integrates material learned during the course.

ENST 481/581: Advanced GIS (Every Semester) This course is designed to move beyond tools and skills learned in Applications in GIS and is valuable in all disciplines. Classes will feature hands-on exercises selected to help you master advanced GIS analysis tools and techniques, while providing experience in the planning and execution of real-world projects.

Field methods

ENST 364: Field Methods for Environmental Science ***NEW IN FA18*** (Every Fall, Ladd) This course provides training and experience in analytical and field methods useful in environmental science, natural science, applied conservation, and environmental work. Topics include site and habitat assessment, ecological monitoring, sampling designs, methods for sampling abiotic and biotic components, including plants, animals, soil sampling, and hydrogeology.

ENST 365: Applied Conservation Biology (Every Spring, Ladd) A hands-on introduction to the concepts of conservation biology and applied conservation practice, including designing and implementing conservation projects. Readings, lectures, classroom exercises, and field projects will immerse students in the tools and techniques needed for successful and sustainable conservation outcomes in contemporary landscapes.

ENST 375: Urban Ecology (Every Spring, Parks) Urban Ecology is a field of study within ecology that focuses on the urban environment as an ecosystem and attempts to understand how humans and nature can better coexist in these highly modified environments. The ultimate goal is to aid efforts for more sustainable cities through better urban planning and practices. It is a multidisciplinary study including topics from ecology, evolution, and conservation biology, as well as architecture, economics, and business.

BIO 381: Introduction to Ecology (Every spring, Pardini/Mangan) This course explores the science of ecology, including factors that control the distribution and population dynamics of organisms and the structure and function of biological communities. It touches on applications of these principles such as conservation, restoration, and disease ecology. Principles of experimental design, quantitative data analysis and interpretation, and mathematical models are critical to the field of ecology and are emphasized throughout the course.

ADVANCED ELECTIVES FOR CRITICAL THINKING, PROBLEM SOLVING, AND COMMUNICATION

ENST 350W: Environmental Writing (Every Spring, Martin) This course aims to provide students with the writing skills they need to be successful in the environmental field upon graduation. Students will examine environmental issues through review of data and facts underlying positions and decisions. They will explore the role of audience, purpose and author angle of vision as they examine the role of multiple stakeholders in environmental issues and processes.

ENST 357: Environmental Problem Solving (Every Spring, Martin) This course aims to provide students with the opportunity to develop and apply problem-solving skills in the context of environmental challenges. Students will learn basic frameworks of decision-making through readings and role-play. Through the role-play students will grapple with the perspectives of multiple stakeholders, the interplay of science and policy, and the ambiguity and uncertainty inherent in decision-making processes.

ENST400: Topics in Environmental Science: Beyond the Evidence (Every Spring, Pardini) This class explores how people's beliefs, identity, and emotions play a role in shaping shape how we process scientific information in largely unconscious ways. Through reading, weekly reflective writing, and discussion we explore the role of world view, political ideology, cultural cognition, and unconscious cognitive processes cab shape our beliefs and behaviors with special attention to the case studies of climate change and vaccination. The class is designed for upper level environmental and pre-health studies.

ENST 315: Fallout: Analyzing Texts and Narratives of the Nuclear Era (Every Spring, Loui) In this environmental humanities course students compare and integrate diverse texts and narratives through which Americans have developed a complex relationship to nuclear technology. Using texts such as literary non-fiction, history, environmental anthropology, natural history and public health, students explore aspects of the Manhattan Project, the Chernobyl Nuclear Reactor accident, and debates regarding the current and future use of nuclear energy. This course emphasizes critical thinking and writing.

HIST 3068: The Human History of Climate Change (Every 1-2 years, Bivar) Climate change is not a new concern: Advisors to the king of France warned against deforestation in the 18th and 19th centuries and experiments revealed the arrival of acid rain in the industrial centers of Great Britain. This course examines the longer history of climate change and how it has been addressed as a scientific, political and environmental issue. The course will also introduce students to the field of environmental history and explore how the methods of this field of inquiry challenge traditional historical categories.

INTERDISCIPLINARY, PROJECT-BASED CAPSTONE COURSES

These courses engage students in collaborative work in interdisciplinary teams on projects, usually with a university- or community partner. Students engage in deep, interdisciplinary work and experience the nuance, ambiguity, and challenge of moving toward self-directed work on real environmental issues.

ENST 405: Sustainability Exchange: Community and University Practicums (Every Semester, Lowry and others) The Sustainability Exchange brings together students working in trans-disciplinary teams to tackle real-world environmental and sustainability problems through experiential education. Students participate in projects with clients or partners on- or off-campus, developed with and guided by faculty mentors, with the intention of delivering an applicable end-product that explores "wicked" problems requiring innovative methods and solutions.

ENST 452: International Climate Negotiation Seminar (Every Fall, Martin) This course is a three-credit advanced seminar for students who will represent Washington University at the annual United Nations Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). Students learn the basics of the UNFCCC process, how to identify, analyze and evaluate policy positions in context of science. Students begin to see the interaction between climate policy, science, technology, and political contexts, and their role in shaping change.

ENST 539: Interdisciplinary Environmental Clinic (Every Semester, Miller, Goode, Hubertz and others) This course constitutes the technical component of an interdisciplinary environmental clinic based at the Law School. Engineering and Arts & Sciences students participate in interdisciplinary teams with law students, handling environmental projects for public interest, environmental or community organizations or individuals.