The linked-major program in environmental studies (ENVS) is the secondary major to a primary major. Students cannot obtain the BA degree with ENVS as their only major. Students must complete all the requirements for graduation from their primary major in addition to those of ENVS as their linked major. Each student will work closely with an ENVS advisor to develop an individual course of study. ENVS requires an introductory course, the sophomore seminar, six elective courses, senior colloquium, and a senior capstone project (thesis, essay, performance, etc.) on an environmental topic that is researched, mentored, and credited in the primary major program. In addition, students must take one course in any subject that fulfills the writing essential capability.

**FACULTY**

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national markets, mass production of food, industrialization of agriculture, and the recent emergence of organics, slow food, and local movements.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: HIST135
Prereq: None

ENVS197 Introduction to Environmental Studies
This interdisciplinary study of human interactions with the environment and the implications for the quality of life examines the technical and social causes of environmental degradation at local and global scales, along with the potential for developing policies and philosophies that are the basis of a sustainable society. This will include an introduction to ecosystems, climatic and geochemical cycles, and the use of biotic and abiotic resources over time. It includes the relationship of societies and the environment from prehistoric times to the present. Interrelationships, feedback loops, cycles, and linkages within and among social, economic, governmental, cultural, and scientific components of environmental issues will be emphasized.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-ESS
Identical With: E&ES197, BIOL197
Prereq: None

ENVS201 Sophomore Seminar in Environmental Studies
This course is designed to introduce students to critical methods for conducting research on environmental issues. Students will gain in-depth experience with methods and paradigms of inquiry from multiple lenses including arts, humanities, and the social and natural sciences as a primer for performing research in the ENVS major. We will explore environmental theory and management at various levels of organization from ecosystems to human communities and countries. This course will challenge the students to rethink the human-environment relationship by recasting policy and science in the context of social-ecological systems. Students will be responsible for weekly writing assignments and discussions on the critical environmental issues of our time. Through the process of reflection, writing, and discussion, students will engage in deep inquiry, exploration, and research of environmental issues and their potential solutions. In the process, students will learn and apply the four stages of scholarly research: (1) critique contemporary theory, (2) identify critical questions and research needs; (3) analysis; and (4) synthesis.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ENVS
Prereq: [E&ES197 or BIOL197 or ENVS 197] OR E&ES199

ENVS205 Sciences as Social and Cultural Practices
Philosophers long construed scientific knowledge as achieved and assessed by individual knowers, but recent work has recognized a greater epistemic role for scientific communities, disciplines, or practices and has taken seriously the social and cultural context of scientific research. This course surveys some of the social, cultural, and political aspects of the sciences that have been most important for scholars in science studies, including differences between experimental, field, and theoretical science; the role of disciplines and other institutions in the sciences; interactions between science and its various publics; the politics of scientific expertise and science policy; the globalization of science; the social dimensions of scientific normativity, from metrology to conceptions of objectivity; race and gender in science; and conceptual exchanges between sciences and other discursive practices. The concept of the social will also receive critical attention in its purported contrasts to what is individual, natural, rational, or cultural.
The last third of the course explores more recent preoccupations with ideas about moral difference, moral change, and the relation between morality and power. Especially since Marx and Nietzsche, moral theory faces a sustained challenge from social theorists who allege moral norms and judgments serve hidden ideological purposes. Some have sought to repair universal ethics by giving an account of progress or the overcoming of bias, while others have argued for plural or relative ethics. Ecological critics have challenged moral theorists to overcome their preoccupation with exclusively human interests and ideals. What kinds of moral reflection might be adequate to problems of global interdependence?

Students will come to understand the distinctive insights and arguments behind all of the positions considered, to recognize more and less cogent lines of response to them, and to shape their own patterns of moral reasoning through careful reflection.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-PHIL
Identical With: PHIL212
Prereq: None

ENVS214 Women, Animals, and Nature
This course will focus on the gendered aspects of human relations with the rest of the natural world. We will explore ecofeminist analyses and challenge popular views about women's special relation to nature. This course will also provide the analytical tools necessary to understand and analyze the roles that actual women (modified by race, class, and sexuality) play in reconceptualizing and reshaping relationships to other animals and the more-than-human world.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ENVS
Identical With: PHIL216, FGSS214
Prereq: None

ENVS215 Humans, Animals, and Nature
A variety of important issues are central to understanding the complexity of relationships between humans, nonhumans, and the rest of nature. The goals of the course are to help students to think critically, to read carefully, to argue well, and to defend their own reasoned views about the moral relations between humans, animals, and nature.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-PHIL
Identical With: PHIL215
Prereq: None

ENVS216 Ecology
Ecology is the scientific study of interactions between organisms and their environment, both biotic and abiotic. We will look at how these interactions shape fundamental characteristics of populations, communities, and ecosystems. Topics will include predation, competition, symbiosis, and effects of stress and resource limitation in diverse environments. We will cover important consequences of interactions such as coevolution, population outbreaks, ecological coexistence, patterns of biodiversity, ecological succession, species invasions, food web dynamics, nutrient and energy cycling, variation in ecosystem goods and services, and global change.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-BIOL
Representing the result of centuries of contemplating, controlling, and conserving, U.S., Germany's policies on sustainability and environmental preservation are unique even by European standards, and in the comparison and conservation in general. Few countries display as active a commitment to protect natural resources and the environment as Germany. Its focus on renewable energies, recycling, food web alteration, invasive species, and climate change. We will use readings from the primary literature and field projects to learn about current research methods used in conservation biology.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-BIOL
Identical With: BIOL220
Prereq: [BIOL182 or MB&B182]

ENVS221 Environmental Policy
This course explores the history of U.S. environmental regulation. We will examine the key features of policy and administration in each major area of environmental policy. Moreover, we will examine several alternatives to public regulation, including free-market environmentalism and association- and standards-based self-regulation. Although the course focuses primarily on U.S. environmental policy, at various points in the course we will draw both on comparative examples and the challenges associated with coordinating national policies and practices on an international level.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-GOV'T
Identical With: GOVT221
Prereq: None

ENVS226 Invasive Species: Biology, Policy, and Management
Invasive species account for 39 percent of the known species extinctions on Earth, and they are responsible for environmental damages totaling greater than $138 billion per year. However, the general population has little knowledge of what invasive species are or what threats they pose to society. In this course, we will explore the biological, economic, political, and social impacts of invasive species. We will begin by exploring a definition of an invasive species and looking at the life history characteristics that make them likely to become pests. Then we will consider the effects of invasive species expansion on the conservation of biodiversity and ecosystem function, as well as their global environmental and political impacts. Finally, we will explore the potential future changes in invasive species distributions under a changing climate.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-BIOL
Identical With: E&ES240, BIOL226
Prereq: [E&ES197 or BIOL197 or ENVS197] OR [BIOL182 or MB&B182] OR E&ES199

ENVS228 Going Green, German-Style: The Relationship to Nature, 1800--Today
Few countries display as active a commitment to protect natural resources and the environment as Germany. Its focus on renewable energies, recycling, and conservation in general is unique even by European standards, and in the U.S., Germany's policies on sustainability and environmental preservation are often held up as models. It is important to recognize, however, that Germans did not achieve this degree of environmental awareness overnight. Rather, it represents the result of centuries of contemplating, controlling, and conserving nature and cannot simply be transferred to other cultures. In this course, we will examine the German (and European) cultural tradition by analyzing artworks and texts from the past two centuries that have both expressed and shaped salient attitudes and emotional responses. The goals of the course are to provide insight into Germany's long and complicated history of defining and relating to nature and to allow you to reflect critically on your own attitudes toward nature and the environment.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-GRST
Identical With: GRST228, GELT228
Prereq: None

ENVS229 Ancient Monuments: Landscape, History, and Memory
In this course, we will examine some of the most renowned sites from Greek and Roman antiquity, such as the Parthenon and the other monuments on and near the Athenian Acropolis, the Colosseum and Forum in Rome, and Pompeii. The aim is to get a broad understanding of their significance, and so the sources will include ancient texts, modern scholarship and travel narrative, and visual representations such as drawings and photographs. Because the course is connected to a theme of "shifting landscapes," we will pay particular attention to the ways in which the ancient sites interact with their surroundings.

Offering: Host
Grading: OPT
Credits: 1.00
Gen Ed Area: HA-ENV'S
Identical With: CCIV229
Prereq: None

ENVS230 The Simple Life (FYS)
As the human population grows toward nine billion and our planet's carrying capacity comes under increasing pressure, many observers believe the human project itself is at risk. What human beings have accomplished is probably unique in the history of the universe; once lost to war, famine, and ecological collapse, the understandings and physical creations of our cultures will be irrecoverable. We must ask ourselves, with considerable urgency, the following questions: How do our values, our economic systems, and our behaviors--as individuals, groups, societies, and cultures--affect the conditions under which we, future generations, and the plants and animals with which we share the earth might live in the future? To what extent and at what cost can technology enable us to adapt to changes already under way? Should we take an "après moi, le déluge" attitude or try to prolong the life of our species, and if so, in what form? Does the so-called simple life, as conceptualized in different times and places, offer any useful models? Does living "green" make sense? What about environmental (in)justice? This course will draw on texts from a variety of periods and disciplines, written in a range of styles and from many perspectives, to examine how these questions and others can be approached. Creative thinking will be strongly encouraged. We will pay particular attention to contemporary sustainability initiatives and threats to the environment in the present moment.

Offering: Crosslisting
Grading: OPT
Credits: 1.00
Gen Ed Area: HA-GRST
Identical With: GRST230, GELT230
Prereq: None

ENVS233 Geobiology
Fossils provide a glimpse into the form and structure of ancient ecosystems. Geobiology is the study of the two-way interactions between life (biology) and rocks (geology); typically, this involves studying fossils within the context of their sedimentary setting. In this course we will explore the geologic record of these interactions, including the fundamentals of evolutionary patterns, the origins and
evolution of early life, mass extinctions, and the history of the impact of life on climate.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-EES
Identical With: E&ES234, BIOL233
Prereq: E&ES101 OR E&ES115 OR E&ES199 OR [E&ES197 or BIOL197 or ENVS197]

ENVS235 Science of Sustainability

What is sustainability? It most certainly is not switching light bulbs or “buying organic,” although perhaps those activities contribute to sustainability. The task for our course will be to undertake a scientific inquiry into the conditions for an enduring human presence on Earth. To do so, we must begin with physical principles, examining both what humans require and demand from the world and what the world is capable of providing. Our inquiry will broaden to include chemical and ecological principles, ultimately asking what the social sciences can do to illuminate the problem without violating the physical constraints nature imposes. Students should have a familiarity with quantitative and algebraic concepts and, above all, a desire to incorporate quantitative thinking into verbal discourse. Writing is also a core element of the course with frequent writing assignments in various formats.

Offering: Crosslisting
Grading: OPT
Credits: 1.00
Gen Ed Area: NSM-PHYS
Identical With: PHYS105
Prereq: None

ENVS241 Labor and Development Economics in Latin America

This course will look specifically at the literature of labor markets and related human capital accumulation in Latin America, which has emerged as an entirely separate area of research in recent years. A large part of this literature in Latin American economic development focuses on urban labor markets, health, and education. The focus of this literature is often on various subsets of the population such as gender and different ethnic groups or rural/urban population. Economic and social policies and external shocks to the local environment will be of particular interest to understand their impact on local economic outcomes. The focus will be foremost on Latin America and cities in Latin America and drawing at times on evidence from across the world for comparison with the Latin America region.

Students will read recent economic research papers, drawing on journal articles and policy papers in this area, and discuss the theoretical and empirical results from research and its implication for policy. Students are expected to actively present and discuss research results and work on individual or group projects. Basic quantitative methods will be taught throughout the course, relating to economic research papers, and the course will also draw on the resources provided by the Quantitative Analysis Center (QAC).

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ECON
Identical With: ECON218, LAST341
Prereq: ECON101 OR ECON110

ENVS245 Climate, Change, and the Ancient World

Climate change has recently become shorthand for Global Warming, the clearcutting of rainforests, and the burning of fossil fuels. Yet while anthropogenic climate change on the global scale is indeed a modern phenomenon, climate change itself is nothing new, and human societies have been negotiating their natural world for millennia: adapting to changing conditions by inventing new technologies, adopting new social structures, and even modifying the landscapes around them.

Examples from around the world, including Africa, the Mediterranean, Australia, the Americas, Asia, and the British Isles, will be used to examine how past societies perceived and interacted with their environments. Aspects of collecting, analyzing and interpreting various climate proxies, and the theoretical foundations for interpreting their relevance to archaeological questions, will constitute major components of this course.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Identical With: ARCP245
Prereq: None

ENVS248 Environmental Investigation and Remediation

This course will cover environmental investigation and remediation methods in varying geologic settings and how they have changed over time due to regulatory changes and advances in technology. An introduction to various aspects of environmental consulting will be incorporated throughout the term using case studies, guest lecturers, and emerging trends and research from online sources.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Identical With: NSM-PHYS
Prereq: E&ES101 OR E&ES115 OR E&ES199 OR E&ES197

ENVS252 Industrializations: Commodities in World History

This course defines “industrialization” broadly to encompass the development and application of systematic knowledge to agriculture and manufacturing in 18th- to 21st-century societies. Although special attention will be devoted to the British and American examples, the course will be organized by commodity rather than nationality, focusing on traffic in materials used in production of food, clothing, and medicines, for example, cotton, rubber, guano, wheat, bananas, and quinine.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: HIST252
Prereq: None

ENVS254 Architecture of the 20th Century

The course considers influential works in architecture, its theory and criticism, and ideas for urbanism, mostly in Europe and the United States, from about 1900 to the present. Early parts of the semester focus on the origin and development of the modern movement in Europe to 1940, with attention given to selected American developments before World War II. Later parts of the course deal with Western architecture from 1945 to the present, including later modernist, postmodernist, and deconstructivist work, urbanism and housing, computer-aided design, green buildings, and postwar architecture in Latin America and Japan and in postcolonial India and Africa.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-ART
Identical With: ARHA254
Prereq: None
ENVS255 Seeing a Bigger Picture: Integrating Environmental History and Visual Studies
This interdisciplinary course approaches the history of environmental policy and opinion making through a frame that takes seriously the rise in power accorded to visual imagery and visual practices (including photography, digital image production, film and new media) in modern society. The course introduces students to key landmarks in the visual history of environmentalism spanning a period from colonial America to the recent past, focusing both on images of nature and on the nature of images.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: ARHA262, HIST262, SISP255
Prereq: None

ENVS260 Global Change and Infectious Disease
Among the most insidious effects of global change are the expanded geographical ranges and increased transmission of infectious diseases. Global warming is bringing tropical diseases, such as malaria, poleward from the tropics; the extreme weather events of a changed world are leading to outbreaks of zoonotic diseases, such as those caused by Hantaviruses; and nonclimatic anthropogenic factors, such as forest fragmentation, are taking their toll on human health, for example, by increasing the incidence of Lyme disease. This course will cover the evidence that global change has increased the geographical ranges and rates of incidence of infectious diseases in humans, in agricultural animals and plants, and in endangered species. We will explore how interactions between different anthropogenic effects (for example, habitat loss and pollution) exacerbate the effects of global warming on infectious diseases. We will analyze and critique projections for future changes in geographic ranges in infectious diseases. Finally, we will cover how revolutions in bioinformatics will increase the resolution of tracking and predicting responses of disease organisms to global change. The course has no formal prerequisites and will introduce material from ecology and microbiology, as needed, to allow students to read and interpret the recent literature on global change and infectious disease.
Offering: Crosslisting
Grading: OPT
Credits: 1.00
Gen Ed Area: NSM-BIOL
Identical With: BIOL173
Prereq: None

ENVS264 Waterways: Maritime World History
Human history has been shaped by the sea. Whether as a source of food, a frontier, a boundary, or a bridge, the sea has represented a site of both opportunity and danger. This course will examine the ways humans have responded to their marine and maritime environments, both in terms of the technologies they have developed to navigate and exploit them but also insofar as the sea has shaped the way humans think about themselves. While our inquiry will extend into the deep past and the early development of human culture and civilization, we will focus on maritime history over the past millennium, the development of oceanic worlds, the rise of the "age of sail" between the 16th and 19th centuries, and the transformation of global navigation and politics with the rise of steam, diesel, and nuclear power.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-GOVT
Identical With: HIST264
Prereq: None

ENVS267 Development in Question: Conservation in Africa
"Why not plant trees?" In 1977 Wangari Maathai started the Green Belt Movement, a popular environmental revolution, in Kenya. Then in the 1990s Nigeria Ken Saro-Wiwa fought for the rights of local communities against the multi-national oil industry. Like many African activists, scientists, and farmers, they placed African experiences at the center of environmental policy and conservation. Yet, popular images of the continent's environment in perpetual crisis blame African practices or disregard African efforts. Such depictions of "desertification" or "over grazing" have impacted international and governmental policy. Recent scholarship suggests that such common perceptions of the environment in Africa and conservation policy are misleading. This course will allow students to critically study the history of environmental management on the continent and the development of the idea of conservation. We will examine game park politics, the history of resource extraction, climate change, and other pressing environmental concerns. We will also study diverse African environmental perspectives from the guardians of sacred forests to activists such as Wangari Maathai and Ken Saro-Wiwa.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: HIST267
Prereq: None

ENVS268 North America Before Columbus
Sometime before the end of the Pleistocene, people living in Siberia or along the Pacific Coast of Asia traveled east and found an hemisphere of arctic, temperate, and tropical climates uninhabited by other humans. Over the next 12,000 years or more, populations diversified into, and thrived in, a range of environments--the last great experiment in human adaptation. This course will follow that process as it unfolded across the continent of North America, from the earliest Paleoindians through 1491. Particular emphasis will be on the nature and timing of the colonization(s) of North America from Asia, the impact of environmental diversity across the continent, and the rise of complex societies.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ANTH
Identical With: ARCP268, ANTH268
Prereq: None

ENVS270 Environmental Philosophy
How should we understand our relation to the more-than-human world? What does it mean to act responsibly within our ecological situation? This course will cover conceptual questions about nature, ecology, and value, and practical questions about how to respond to climate change, habitat loss, resource depletion, and other ecological problems. In particular, we will challenge the temptation to idealize "pure" nature as distinct from the site of human practices. As a result, we must consider the complex interrelationships between ecological concerns and concerns about social justice.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-PHIL
Identical With: PHIL270
Prereq: None

ENVS274 Water's Past--Water's Future: A History and Archaeology of Water Use and Management
Our world uses water as if this life-giving resource had no limits and does so in the face of mounting scientific evidence that our planet is facing a long period of water shortage. This course will look critically at the ways in which people have used and managed water in the past, from the ancient world up to the Industrial Revolution, with the aim of assessing the relationship of past uses of water to present and future ones. Beginning with irrigation agriculture, we will consider ways in which water has been used for food production, for generating power, for hygiene, for recreation, and for symbolic purposes. We will also consider...
water use technologically by looking at hydraulic infrastructures (aqueducts, canals, cisterns, dams, fountains, and sewers) in relation to water use and control and its impact on the environment. Finally, we will consider streams, rivers, and lakes as natural components incorporated into man-made water systems as well as matters of drainage and flood control.

Offering: Host  
Grading: A-F  
Credits: 1.00  
Gen Ed Area: SBS-ENVS  
Identical With: ARHA274, ARCP274  
Prereq: None  

ENVS275 The American Landscaping in Painting, Literature, Science and the Popular Imagination

In a time of global warming, the issue of mankind’s relationship with the natural landscape has never been more pressing. The course will focus on how the field of 19th-century American landscape painting helped stimulate new ideas about our place in the environment—for example spurring the creation of America’s National Parks as well as of city parks and greenspaces designed to look natural, such as Central Park in New York. This course will also explore the notion of landscape more largely. What is our personal landscape, and how does it help define our personal identity? How can you detect traces of history in the landscape? In what ways is the American landscape unique, and how did scientists, writers and painters discover and respond to these qualities? How should we respond to the crisis of global warming, which is rapidly transforming and upending our familiar landscape and even placing human existence at risk?

Offering: Host  
Grading: A-F  
Credits: 1.00  
Gen Ed Area: HA-ENV  
Identical With: AMST275, ARHA275  
Prereq: None  

ENVS280 Environmental Geochemistry

A qualitative and quantitative treatment of chemical processes in natural systems such as lakes, rivers, groundwater, the oceans, and ambient air is studied. General topics include equilibrium thermodynamics, acid-base equilibria, oxidation-reduction reactions, and isotope geochemistry. This course (together with the associated lab course, E&ES 251) is usually taught as a service-learning course in which students work with a community organization to solve an environmental problem. Previous classes have evaluated the energy potential of a local landfill and investigated the cause and possible remediation of local eutrophic lakes.

Offering: Crosslisting  
Grading: A-F  
Credits: 1.00  
Gen Ed Area: NSM-EE  
Identical With: E&ES250  
Prereq: None  

ENVS281 Environmental Geochemistry Laboratory

This course will supplement E&ES 250 by providing students with hands-on experience of the concepts taught in E&ES 250. The course will emphasize the field collection, chemical analysis, and data analysis of environmental water, air, and rock samples. This course is often taught as service-learning course where the class works with a community organization to solve an environmental problem. The course usually concludes with a public presentation of the work. Past service-learning projects have examined landfills, dammed rivers, and polluted lakes.

Offering: Crosslisting  
Grading: A-F  
Credits: 0.50  
Gen Ed Area: NSM-EE  
Identical With: E&ES251  

ENVS282 Environmental Law and Policy

If you listen to, watch, or read environmental news and would like some history or perspective...if you would like some sense of where environmental law and policy may be going...and if you are prepared for a class which is as much about the open issues as the answers, then Environmental Law and Policy is for you. This course is taught using the Socratic (highly interactive) method and culminates in student run hearings in which you will prepare, present, and argue about issues from what is a "water" of the U.S. to recycling and reclamation to what is solid and hazardous waste?

Offering: Host  
Grading: A-F  
Credits: 1.00  
Gen Ed Area: SBS-ENVS  
Prereq: [E&ES197 or BIOL197 or ENVS197] OR E&ES199  

ENVS287 Performing the Posthuman: Music and Auditory Culture in the Age of Animanities

"Animanities" takes seriously the aural and performance worlds of the nonhuman. "Posthuman," according to the Oxford English Dictionary (OED), refers to the idea that “humanity can be transformed, transcended, or eliminated by the interference or evolutionary process; artistic, scientific, or philosophical practice which reflects this belief.” This seminar engages questions of musical difference by addressing posthuman performance, the musicality of animals, music that imitates nonhuman sound worlds, and cross-species and multi-species performance. Throughout the course, we will think across varied types of sounds to explore and contextualize familiar questions about how we sing, play, perform, stage, and sound musical identity, examining the intersections among the humanities, science and technology studies, and the sonic arts. Our explorations will cross through the fields of musicology, ethnomusicology, and sound studies. By listening across different kinds of sound cultures, we will interrogate how traditions of listening shape our habits of perceiving others, how we hear nonhuman animals, how we incorporate nonhuman sounding into music composed by humans, how technology has played a role in the study and development of nonhuman and human musicality, and what it means to listen to and value sonic difference more broadly. Through discussions of musical and cultural difference that enrich ongoing discussions of race, gender, and sexualities, we will come to a stronger understanding of music’s role in imagined and experienced natural worlds. Topics and case studies will include audio bird guides, new age nature recordings, multi-species "collaborative" performances, sampled and electronically rendered animal and nature performance in digital video games, wildlife field recordings and documentary sound design, forms of animal and environmental mimesis used by composers, the way nonhuman animal behavior influenced experimental music communities, and descriptions of the musicking of nonhuman animals by the National Audubon Society and other wildlife guides and field recording initiatives. This seminar draws on the classroom community’s interdisciplinary backgrounds and interests as well as readings and case studies that cross and challenge disciplinary boundaries. Students can succeed in this course without previous musical knowledge.

Offering: Crosslisting  
Grading: A-F  
Credits: 1.00  
Gen Ed Area: HA-MUSC  
Identical With: MUSC287, AMST278  
Prereq: None  

ENVS288 Music, Sound, and the Environment in the Anthropocene

In this course we will explore how environmental works have proliferated throughout the academy and how scholars across the humanities are re-evaluating the reciprocal relationships among society, culture, and the environment. Over the course of the semester we will explore the diverse and interconnected ways in which contemporary composers, popular musicians,
sound artists, world music practices, and collaborative arts practitioners draw on natural and urban environments in order to comment on current environmental and energy issues, trauma, the relationships among the arts, humanities and science and technology studies, representations of the environment and the environmental past, and participate in social activism. Employing socially and environmentally engaged musicological analysis, this course will focus on five distinct areas: We will analyze how environmental sites and situations are represented in music; examine why environmentalist ideologies are integrated into the musical narratives and/or sonic choices made by the artist; address how artists conceptualize the environment and express their relationship to it; grapple with what motivates these artists to incorporate environmental commentary into their compositions, illustrating how sociocultural and environmental factors influence creative expression; and question how personal and societal values concerning relationships between society and the environment are disseminated and constructed through music. We will also explore the various ways in which nature, urbanity, and environment are constructed in the production, performance, consumption, and reception of music. Through our reading discussions, writing, and applied projects, some of the questions we will address include: How do the intersections of landscapes and cityscapes produce multifarious artistic responses? How are communities whose economy depend on, or historically depended on, energy and/or natural resource industries signified or evoked through music? How are past and present histories of place expressed, recorded, and remembered through detailed and affective sensory experience? How do we determine the health of our soundscapes? How is music and sound mobilized in social activism? How are notions of identity, as shaped by a physical environment and the ideologies connected to place, constructed and communicated? As we engage with the critical geography of sound, we will address the global networks, musical mobilities, circulation of sounds, traditions and musicians, and the ways in which landscape, mapping, urban planning, and landscapes are expressed in music.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-MUSC
Identical With: MUSC288
Prereq: None

ENVS290 Oceans and Climate
Earth's climate is not static. Even without human intervention, the climate has changed. In this course we will study the major properties of the ocean and its circulation and changes in climate. We will look at the effects of variations in greenhouse gas concentrations, the locations of continents, and the circulation patterns of oceans and atmosphere. We will look at these variations on several time scales. For billions of years, the sun's energy, the composition of the atmosphere, and the biosphere have experienced changes. During this time, Earth's climate has varied from much hotter to much colder than today, but the variations were relatively small when compared to the climate on our neighbors Venus and Mars. Compared with them, Earth's climate has been stable; the oceans neither evaporated nor froze solid. On shorter time scales, different processes are important. We will look at these past variations in Earth's climate and oceans and try to understand the implications for possible climates of the future.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-EEs
Identical With: E&ES260, E&ES660
Prereq: E&ES101 OR E&ES199 OR E&ES115 OR [E&ES197 or BIOL197 or ENVS197]

ENVS292 Techniques in Ocean and Climate Investigations
Weekly and biweekly field trips, and computer and/or laboratory exercises will allow us to see how climate and oceans function today and in the past. In addition to our data, we will most likely use the Goddard Institute for Space Studies climate model to test climate questions and data from major core (ocean, lake, and ice) repositories to investigate how oceans and climate function and have changed.

Offering: Crosslisting
Grading: A-F
Credits: 0.50
Gen Ed Area: NSM-EEs
Identical With: E&ES261, ARHA292, ARCP292
Prereq: E&ES101 OR E&ES115 OR [E&ES197 or BIOL197 or ENVS197] OR E&ES199

ENVS296 The Mountains in the History of Art
This course is a comparative study of mountains as artistic inspiration, focusing on the Alps and the Black Forest in Europe, and the Appalachians. In medieval Europe, passes through the Alps and the Black Forest were conduits for the transit of men, goods, and cultural forms. Mountains were not barriers but passageways that linked cultures. In 16th- and 17th-century Europe, Dutch artists--Breughel, Seghers, Ruisdael, Jos de Momper--first gave full expression to the grandeur, far beyond a human scale, of Alpine scenery. Gradually, mountains came to be viewed as places of aesthetic beauty and as manifestation of the sublime. Romanticism, in the visual arts, poetry, and music, captures the experience of the Alps as both symbol and physical manifestation of the transcendent. In the paintings of C.D. Friedrich, Constable, and Turner, mountains become the means to express the concept of the Sublime. A deeper understanding of the Sublime may be found in the poetry of Wordsworth and Coleridge. In America, too, mid-19th century painters focused on the mountains, we will study Hudson River School artists represented in CT collections (Church, Cole). The mid-19th century saw the birth of mountaineering as a sport. We will read selections from narratives of climbing expeditions--Leslie Stephen, Mark Twain. After World War One, mountaineering took on a heightened spiritual dimension for men who had survived the horrors of trench warfare. In Austria and Germany, climbing was also identified with nationalism and presumed masculinity. We will look critically at the idea of climbing as masculine ideal. What about women mountaineers--of whom there were many? And what about women artists? We will study the art of the newly rediscovered American landscape painter Martha Wood Belcher. Sadly, climbing was also associated with National Socialism and antisemitism. In fact, however, the development of climbing and skiing in the Alps owes much to Austrian and German Jews. In art, too, during the first decades of the 20th century, mountains were an important source of spiritual inspiration for painters whose work is central to the evolution of modern art.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-ART
Identical With: ARHA296
Prereq: None

ENVS300 Sustainable Behavior Change
Very frequently, the default mode of influencing environmental behaviors is through increased information sharing and awareness raising. While these efforts are well-intentioned, psychological research indicates that in most cases, increased knowledge and awareness do little or nothing to alter behaviors because of the complexity and difficulty of changing ingrained habits. Through this course, which is a required component of the Eco Facilitators Program, we will draw on extensive behavior change, communication, and social marketing research to introduce theory and practice that will increase your understanding of effective methods to influence behavior. You will develop theoretical knowledge, practical skills, and an opportunity to apply your learning within a residence hall setting.

Offering: Host
ENVS303 Ukraine and Its Environment
International perspectives on environmental issues are critical in order to address the challenges facing the world. Developing an international perspective requires more than learning from printed literature—it requires in-country experience and the desire to be able to view issues through different cultural lenses. This course will provide such experience by learning about the diversity of Ukrainian environments, people, and cultures both in the classroom at Wesleyan and by traveling to Ukraine during Spring Break. During our time in Ukraine we will receive lectures in English from noted scholars, politicians, professors and scientists on topics such as environmental law, global environmental security, urban environment, environmental policy in developing states, and sustainable development for the developing world. We will travel and learn from scientists at Chernobyl about the regeneration of forest ecosystems, learn from agronomists about agriculture on the steppes, and learn from politicians and scholars about Ukrainian environmental policy and their views of U.S. policies. We will also enter into round table discussions with university students to exchange ideas about potential international solutions and approaches to environmental problems. These are just some of the experiences that are planned for our visit. Ukraine, as a pivotal democracy of the former Soviet Bloc, is an amazing place to witness how a nation wrestles with dramatic changes in policy. At the same time Ukraine is culturally diverse, which presents interesting challenges to formulating fair and cohesive policies.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-ENVS
Identical With: CGST303
Prereq: ENVS197 OR E&ES199

ENVS304 Environmental Politics and Democratization
This course explores the role that environmental movements and organizations play in the development and transformation of democratic politics. It examines the political role of environmental movements in nondemocracies, transitioning democracies, and advanced democracies.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-GOVT
Identical With: CEAS304, GOVT304
Prereq: None

ENVS305 Moral Ecologies and the Anthropology of Vitality
What is vitality? How is vitality nurtured? What hinders vitality? How might we participate in the flourishing of all life? This course will explore the "anthropology of vitality" to designate a body of emerging literatures in anthropology, science studies, religious studies, human geography, and ecological humanities centered on questions of the health, wealth, and vitality of communities understood to include both the human and the nonhuman worlds. Much of this literature is emerging in response to the intertwined global crises of social and environmental justice and a corresponding and urgent call for a new ethics. We will approach these concerns as an issue—moral ecology—in response to Michel Foucault's point in THE ORDER OF THINGS (1970) that "modern thought has never been able to propose a morality." The authors we will read work across the nature-culture ontological divide by expanding modes of reasoning to bring together, for example, medicine and ecology, ritual and environment, nature and morality, politics and religion, cosmology and pragmatism, gift exchange and the production of wealth, regeneration and death, knowledge and ethics. Topics include the meanings of prosperity and vitality, moral idioms of nature, animism, epistemologies of embodiment, ecological and cosmological reasoning and systems of classification, relational ontologies, death, waste and pollution, ecology and healing, ritual and world making.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ENVS
Identical With: ANTH303, SISP305
Prereq: None

ENVS307 The Economy of Nature and Nations
On many of the key environmental problems of the 21st century, from climate change to biodiversity conservation, the perspectives of ecology and economics often seem poles apart. Ecology is typically associated with a skeptical stance toward economic growth and human intervention in the environment, while economics focuses on understanding (and often, celebrating) human activities of production, consumption, and growth. At the same time, ecology and economics share a common etymology: both words spring from the Greek oikos, or household. They also share much common history. This course thus explores the parallel histories of economics and ecology from the 18th century to the present, focusing on changing conceptions of the oikos over this period, from cameralism's vision of the household as a princely estate or kingdom, continuing through the emergence of ideas about national or imperial economic development, and culminating in the dominant 20th-century recasting of economics as being centrally concerned with problems of resource allocation. Simultaneously, the course explores connections between changes in economics and the emergence of ecological science over this period, from Enlightenment natural history and early musings on the "economy of nature," to the design of markets for carbon credits today.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: HIST307, SISP307
Prereq: None

ENVS310 The Economics of Sustainable Development, Vulnerability, and Resilience
This course will build on the first principles of economics as applied to sustainable development and decision making under uncertainty. One of the course's major objectives will be to explore how efficiency-based risk analysis can inform assessments of vulnerability and resilience from uncertain sources of external stress in ways that accommodate not only attitudes toward risk but also perspectives about discounting and attitudes toward inequality aversion. Early sessions will present these principles, but two-thirds of the class meetings will be devoted to reviewing the applicability of insights drawn from first principles to published material that focuses on resilience, vulnerability, and development (in circumstances where risk can be quantified and other circumstances where it is impossible to specify likelihood, consequence, or both). Students will complete a small battery of early problem sets that will be designed to illustrate how these principles work in well-specified contexts. Students will be increasingly responsible, as the course progresses, for presenting and evaluating published work on vulnerability and resilience—offering critiques and proposing next steps. Initial readings will be provided by the instructor and collaborators in the College of the Environment, but students will be expected to contribute by bringing relevant readings to the class from sources germane to their individual research projects. Collaboration across these projects will thereby be fostered and encouraged by joint presentations and/or presenter-discussant interchanges.

Offering: Host
Grading: OPT
Credits: 1.00
Gen Ed Area: SBS-ENVS
Identical With: ECON212
Prereq: ECON110
ENVS313 Microbes and Human-Caused Environmental Change
This is a time of unprecedented change in the world we share with billions of species. Unlike the previous catastrophic changes seen over geological time, the changes we see today are caused primarily by just one species, our own. In this new human-dominated era, the Anthropocene, humans have critically changed the conditions of life through a great diversity of activities, including release of greenhouse gases into the atmosphere, accelerated transport of organisms, fragmentation of forests, consumption of antibiotics, agriculture, hunting prey to near extinction, bushmeat hunting, and many other activities. This course will address two kinds of effects of each of these activities on microbes: (1) that humans and agricultural animals and plants are being subjected to new infectious diseases, and the geographical and temporal patterns of infection are changing; and (2) microbes are being challenged to adapt to new environmental challenges, both biotic and abiotic. Students will read and discuss articles from the scientific literature, and each student will write a research proposal.
Offering: Host
Grading: OPT
Credits: 1.00
Gen Ed Area: NSM-ENVS
Identical With: BIOL313
Prereq: [BIOL182 or MB&B182]

ENVS314 Environmentalism in a Global Age
In the 1970s, popular movements achieved landmark environmental protections in the United States and in Europe. Yet in that same period, the globalization of industrial production threatened to undercut the effectiveness of national laws to curb pollution. Moreover, the second half of the twentieth century saw the emergence of new problems like acid rain that transcend national boundaries. This seminar investigates how environmental activism has responded to a range of challenges in the global age, from economic development and species conservation to population growth and family planning. As those two examples suggest, environmentalism has engaged with key developments in the modern world, sometimes in troubling ways. Although the subject matter is historical, this course will also focus on what the history of global environmentalism can contribute to contemporary advocacy, not least around issues related to climate change.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: HIST314
Prereq: None

ENVS316 Community Research Seminar
Small teams of students will carry out research projects submitted by local community groups and agencies. These may involve social science, natural science, or arts and humanities themes. The first two weeks of the course will be spent studying the theory and practice of community research. Working with the community groups themselves, the teams will then design and implement the research projects.
Offering: Crosslisting
Grading: A-F
Credits: 1.50
Gen Ed Area: SBS-SOC
Identical With: SOC316
Prereq: None

ENVS320 Quantitative Methods for the Biological and Environmental Sciences
This course offers an applied approach to statistics used in the biological, environmental, and earth sciences. Statistics will be taught from a geometric perspective so that students can more easily understand the derivations of formulae. We will learn about deduction and hypothesis testing as well as the assumptions that methods make and how violations affect applied outcomes. Emphasis will be on analysis of data, and there will be many problem sets to solve to help students become fluent with the methods. The course will focus on data and methods for continuous variables. In addition to basic statistics, we will cover regression, ANOVA, and contingency tables.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-BIOL
Identical With: E&ES570, E&ES270, BIOL520, BIOL320
Prereq: None

ENVS325 Healthy Places: Practice, Policy, and Population Health
The built environment influences many aspects of health and well-being: psychological stressors (crime, noise, and violence), what people eat, the water they drink, the air they breathe, where (or if) they work, the housing that shelters them, where they go for health care, what social networks are available for support, and how political power is distributed and public resources allocated. How cities, suburbs, and rural areas are managed, local policy, and planning and design decisions can all help determine whether the places we live will be threats to public health and, perhaps more important, to an aging society. The focus of this course connects the fields of planning, psychology, and public health to explore contemporary challenges (and innovations) in the 21st-century built environment. Students will explore the multiple forces that impact population health, how to analyze these determinants, and what roles planning and public health agencies, as well as other institutions such as local governments, civil society, the private sector, and communities themselves, can play in research and action aimed at improving physical and mental health.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-ENVS
Identical With: PSYC325
Prereq: None

ENVS337 The Origins of Bacterial Diversity
Wherever there is life, there are bacteria. Free-living bacteria are found in every environment that supports eukaryotes, and no animal or plant is known to be free of bacteria. There are most likely a billion or more species of bacteria, each living in its unique ecological niche. This course will explore the origins of bacterial biodiversity: how bacteria evolve to form new species that inhabit new ecological niches. We will focus on how the peculiarities of bacterial sex and genetics facilitate bacterial speciation. Topics will include the characteristics of bacterial sex, why barriers to genetic exchange are not necessary for speciation in bacteria, the great potential for formation of new bacterial species, the evolutionary role of genetic gifts from other species, and the use of genomics to identify ecologically distinct populations of bacteria.
Offering: Crosslisting
Grading: A-F
Credits: 0.50
Gen Ed Area: NSM-BIOL
Identical With: BIOL537, BIOL337
Prereq: [BIOL182 or MB&B182]

ENVS340 The Forest Ecosystem
This course examines basic ecological principles through the lens of forest ecosystems, exploring the theory and practice of forest ecology at various levels of organization from individuals to populations, communities, and ecosystems. Lectures, lab exercises, and writing-intensive assignments will emphasize the quantification of spatial and temporal patterns of forest change at stand, landscape, and global scales.
Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-BIOL
Identical With: BIOL546, BIOL346, E&ES238, E&ES538
ENVS347 Ethics, Ecology, and Moral Change
People commonly recognize that in facing global climate crises, we need to change our habits and practices. Yet our activities are bound up with our perceptions and with our embodied experience of value and possibility. This seminar dives into recent attempts to radically rework our ways of understanding and inhabiting the world. As the flip-side of environmental alienation is alienation from our embodiment, our sessions will incorporate movement and other challenges to sedentary classroom habits.

Given an account of thinking and action as always actively embodied and embedded in our surroundings, we will consider the hypothesis that shifts in action emerge together with shifts in perception. Radical accounts of metaphor and its uptake will help us develop accounts of perceptual change. Our readings will follow a variety of metaphorical directions, including animism and animacies, affordance and hyperobject, process, event and intra-action, native and other, inflammation and balance, dwelling and death, consumption and sustainability. How -- and with what risks and unexpected outcomes -- can these patterns of recognition help in orienting us to the challenges of environmental interdependence and volatility?

This course benefits from collaborative visits with philosopher-dancer Jill Sigman, via Wesleyan’s Creative Campus Initiative. Sigman will co-shape discussion and activities during at least two of our sessions.

Offering: Crosslisting
Grading: OPT
Credits: 1.00
Gen Ed Area: SBS-PHIL
Identical With: PHIL347
Prereq: None

ENVS352 Energy and Modern Architecture, 1850–2015
This seminar seeks to study the evolution of mechanical systems for heating, ventilating, and cooling in modern architecture from the mid-19th century to the present. The aim is to show how architects, engineers, fabricators, and urban governments worked to develop modern systems of environmental controls, including lighting, both as means of improving the habitability of buildings and health of their occupants. The course will trace the adaptation of technical innovations in these fields to the built environment and how those responsible for it sought to manage energy and other resources, such as funds and labor, to create optimal solutions for different building types, such as factories, theaters, assembly halls, office buildings, laboratories, art museums, libraries, and houses of various kinds, including apartment buildings for higher- and lower-income residents. An important theme will be the relationship of energy systems for individual buildings and urban infrastructure, including water systems, electrical, and other utilities. The last part of the course focuses on contemporary green, or sustainable, architecture, including passive and active solar heating, photovoltaics, energy-efficient cooling, LEED certification, wind and geo-exchange energy, green skyscrapers, vertical farming, and zero carbon cities in the United States, Europe, and Asia.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-ART
Identical With: ARHA352
Prereq: None

ENVS353 Agricultural Food Webs
Ecological communities are structured by feeding interactions, and agricultural systems are no exception to this rule. This class will focus on attributes of food webs that impact agriculture, including topics such as natural biological control of insect pests, to soil microbes and nutrient cycling, to causes of honeybee colony collapse disorder. This course includes a rigorous survey of both ecological theory and applied environmental problems. Students will read primary literature from the fields of food web ecology and agroecology and discuss the implications through group work.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-ENVS
Identical With: BIOL354
Prereq: BIOL182 or BIOL197

ENVS361 Living in a Polluted World
This course treats the occurrences and origins, natural pathways, toxicologies, and histories of the major environmental contaminants. We all know about lead and its effects on humans, but how about cadmium and hexachromium, or the many unpronounceable organic contaminants, usually referred to by some acronym [e.g., DDT, POPs]? To be effective in this course, students will need basic college-level proficiency in chemistry and math as we will delve into aspects of geochemistry, geology, toxicology, environmental law, and some math. The class consists of lectures, one major project, Hg-in-hair class study, and a class project on pollution records from a 125-year-old tree slab that has year rings. We will drill all rings and analyze the wood for Hg, Pb, nuclear contaminants, and several stable isotopes. Some will do a paleoclimatic record on the rings as well. Students will jointly review various sections of a report on this original research. This is also a service learning course, providing environmental outreach to the larger Middletown community on local pollution over the last 125 years (the tree slab with its records will go on display at Wesleyan).

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: NSM-ENVS
Identical With: E&ES361
Prereq: None

ENVS369 Ecological Resilience: The Good, the Bad, and the Mindful
This course will examine the concepts of resilience, fragility, and adaptive cycles in the context of ecosystem and social-ecological-system (SES) structures. These concepts have been developed to explain abrupt and often surprising changes in complex ecosystems and SES that are prone to disturbances. We will also include nonhierarchical interactions among components of systems (termed panarchy) to compare the interactions and dependencies of ecological and human community systems. A systems approach will be applied to thinking about restoration ecology, community reconstruction, and adaptive management theory.

All of the terms--resilience, fragility, adaptation, restoration, reconstruction—are fraught with subjectivity and valuation. We will use mindfulness and meditation techniques (including breathing and yoga) to more objectively and dynamically engage in the subject matter, leaving behind prejudice or bias. Students will be expected to approach these techniques with an open mind and practice them throughout the semester. The objective is to provide students with a more comprehensive framework with which to gain deeper understanding and integration of the science with the social issues.

Offering: Host
Grading: A-F
Credits: 1.25
Gen Ed Area: NSM-ENVS
Identical With: E&ES242, BIOL369
Prereq: [E&ES197 or BIOL197] OR [BIOL182 or MB&B182]

ENVS376 The Artist in the City: Civic Engagement and Community-Based Art-Making in the Urban Landscape
Through both theoretical analysis and practical application, students will explore how, in a collaborative community setting, art-making can be used to address
environmental issues and spark community dialogue. Lectures, readings, and research will provide an overview of the work of contemporary artists who engage directly in the life of the city, incorporate public employees and public land, and explore new means of civic participation. Students will study various models of community engagement and apply theoretical work to their field-based research. For final projects, students will direct short, creative-based projects in collaboration with Middletown community members to be presented as part of the Riverfront Encounter.

Offering: Host
Grading: A-F
Credits: 1.25
Gen Ed Area: HA-ENVS
Identical With: DANC376
Prereq: None

ENVS377 Perspectives in Dance as Culture: What the Body Knows--Social Change and Revolution

In this project-based class we will study the work of movement artists who directly address and engender social change. We will engage in methods of physical practice that focus on contemplation, transformation, physical re-orientation and social engagement. Requirements will include regular studio practice, and the development of a personal practice and personal manifesto. The final project will consist of a semester-long research project on a topic that can be characterized as a disruption or disaster. The research project will culminate in a persuasive position paper and a performative or otherwise organized social action (performance, site-specific work, installation, demonstration, or community action).

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-DANC
Identical With: ANTH325, DANC377
Prereq: None

ENVS381 Japan’s Nuclear Disasters

The atomic bombings of Hiroshima and Nagasaki in 1945 are central to the history of the 20th century. This course examines the scientific, cultural, and political origins of the bombs; their use in the context of aerial bombings and related issues in military history; the decisions to use them; the human cost to those on whom they were dropped; and their place in history, culture, and identity politics to the present. Sources will include works on the history of science; military, political, and cultural history; literary and other artistic interpretations; and a large number of primary source documents, mostly regarding U.S. policy questions. In addition, we will be examining the development of the civilian nuclear industry in Japan with a focus on the nuclear meltdowns in Fukushima and other accidents. This is an extremely demanding course.

This interdisciplinary, experiential, and experimental course combines studio learning (movement studies and interdisciplinary, creative exploration) and seminars (presentations and discussions). No previous dance or movement study is required, and the course is not particularly geared toward dancers or performers. However, your willingness to experiment on and share movement is important. We encourage you to think about movement as a method of accessing human experiences and making distance malleable, a way to explore your own sensations, thoughts, and reactions in learning history.

Offering: Crosslisting
Grading: A-F
Credits: 1.50
Gen Ed Area: SBS-HIST
Identical With: CEAS384, SISP381, DANC381, HIST381
Prereq: None

ENVS387 History of the End

How will it end? Scientific hubris, a nuclear event, an asteroid, environmental disaster, overpollution, resource scarcity, commodity price spikes, riots, social chaos, social control? This seminar investigates how people have imagined apocalypse and post-apocalypse over time, on the premise that fantasies of the end provide a window into the anxieties of the societies that produce them.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: SISP387, HIST387
Prereq: None

ENVS391 Senior Colloquium: Environmental Studies

The colloquium will provide students and faculty the opportunity to discuss the senior projects. Students will speak for up to 10 minutes about the topic and strategies for their senior project. Faculty and the seniors can provide insights, references, research resources, or advice. Mentors from the primary department or programs will also be invited.

Offering: Host
Grading: Cr/U
Credits: 0.25
Gen Ed Area: None
Prereq: None

ENVS392 Senior Colloquium: Environmental Studies

The colloquium will provide students and faculty the opportunity to discuss the senior projects. Students will make half-hour presentations on their projects followed by 30 minutes of discussion. Two students will present per colloquium session. Any interested faculty may attend, but the project mentors and ENVS advisors will be especially invited, as well as all ENVS majors. Two weeks prior to their presentation, students will distribute several critical published works (e.g., articles, essays) to enhance the level of discussion for their topic. The colloquium may also invite several presentations by faculty or outside speakers.

Offering: Host
Grading: Cr/U
Credits: 0.25
Gen Ed Area: None
Prereq: None

ENVS399 History and Geography

Maps are part of a broader family of value-laden images. This is a research seminar about the global history of cartography from 1490s to the recent past. We will study maps from the early modern and modern world and examine how maps were used as instruments of political power, shaped the imagination of peoples around the world, and inspired new ways to imagine our self-identity.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: SBS-HIST
Identical With: SISP399, HIST399, CEAS214
Prereq: None

ENVS401 Individual Tutorial, Undergraduate

Topic to be arranged in consultation with the tutor.

Offering: Host
Grading: OPT

ENVS402 Individual Tutorial, Undergraduate

Topic to be arranged in consultation with the tutor.

Offering: Host
Grading: OPT

ENVS403 Senior Essay: Environmental Studies

All ENVS majors are required to complete a senior capstone project in a form that is approved by their primary major with a topic that is approved by the
commented on them. In this class, the skills and knowledge gained in ARST239 were used to document dramatic shifts in society, painting reflecting these changes. The shifting viewpoints of morality, concepts of the future, and abstract conditions in the world—man-made or natural—are often conveyed through language, visual expressions of art, and abstract thought. Since the beginning of time, people have created art to document events in nature and society and to convey ideas and emotions as they responded to these shifts.

Offering: Host
Grading: OPT

ENV404 Senior Essay: Environmental Studies
All ENVS majors are required to complete a senior capstone project in a form that is approved by their primary major with a topic that is approved by the student's ENVS advisor. In this event, the student cannot find a mentor for their capstone project, the student may complete a special written research project to meet the research requirement. The topic must be approved by the ENVS advisor and progress must be reported to both the ENVS advisor and the Program Director during the fall semester. The written project is a senior essay, using primary sources and must concern an environmental topic from the perspective of the student's primary major. The senior project is due at the senior thesis deadline. It will be the responsibility of the ENVS Program Director to find a suitable reader to evaluate the written work.

Offering: Host
Grading: OPT

ENV403 Senior Thesis Tutorial
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: A-F

ENV410 Senior Thesis Tutorial
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: A-F

ENV411 Group Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

ENV412 Group Tutorial, Undergraduate
Topic to be arranged in consultation with the tutor.
Offering: Host
Grading: OPT

ENV419 Student Forum
Student-run group tutorial, sponsored by a faculty member and approved by the chair of a department or program.
Offering: Host
Grading: Cr/U

ENV420 Student Forum
Student-run group tutorial, sponsored by a faculty member and approved by the chair of a department or program.
Offering: Host
Grading: Cr/U

ENV440 Painting II: The Shifting Landscapes of the Mind, Nature, and History
Since the beginning of time, people have created art to document events in nature and society and to convey ideas and emotions as they responded to shifting conditions in the world—be they man-made or natural. Before written language, visual expressions of morality, concepts of the future, and abstract thought in the sciences and religion were represented in painting. Whenever dramatic shifts were experienced in society, painting documented them and commented on them. In this class, the skills and knowledge gained in ARST239 will serve as the foundation upon which students will be challenged to become technically proficient while they explore the topic of shifting landscapes or the shifting viewpoints of the mind, history, and nature. The themes, prompts, and concerns addressed in this course will allow for any formal, conceptual, or stylistic form of expression to resolve them—each student will be working differently. The goal of this class is for students to become fluent with the medium and make aesthetic choices that can best convey their ideas about and responses to each prompt. Lectures and meaningful class discussions will provide information and feedback about historical and contemporary issues and the plans for work. Individual and group critiques as well as museum and gallery trips will complement class work.

Offering: Crosslisting
Grading: A-F
Credits: 1.00
Gen Ed Area: HA-ART
Identical With: ARST340
Prereq: (ARST131 AND ARST239)

ENV447 Independent Study, Undergraduate
Credit may be earned for an independent study during a summer or authorized leave of absence provided that (1) plans have been approved in advance, and (2) all specified requirements have been satisfied.

Offering: Host
Grading: A-F
Credits: 1.00
Gen Ed Area: None
Prereq: None

ENV449 Education in the Field, Undergraduate
Students must consult with the department and class dean in advance of undertaking education in the field for approval of the nature of the responsibilities and method of evaluation.

Offering: Host
Grading: OPT
Credits: 1.00
Gen Ed Area: None
Prereq: None

ENV491 Teaching Apprentice Tutorial
The teaching apprentice program offers undergraduate students the opportunity to assist in teaching a faculty member's course for academic credit.

Offering: Host
Grading: OPT

ENV492 Teaching Apprentice Tutorial
The teaching apprentice program offers undergraduate students the opportunity to assist in teaching a faculty member's course for academic credit.

Offering: Host
Grading: OPT