ENVIROMENTAL STUDIES (EVST)

* EVST 020a, Sustainable Development in Haiti  Gordon Geballe
The principles and practice of sustainable development explored in the context of Haiti’s rich history and culture, as well as its current environmental and economic impoverishment. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.  WR

* EVST 030a / ARCG 031a / NELC 026a, Origins of Civilization: Egypt and Mesopotamia  Harvey Weiss
The origins of the earliest civilizations in Mesopotamia and Egypt along the Nile and Tigris-Euphrates Rivers explored with archaeological, historical and environmental data for the origins of agriculture, the classes and hierarchies that marked earliest cities, states and empires, the innovative monumental architecture, writing, imperial expansion, and new national ideologies. How and why these civilizational processes occurred with the momentous societal collapses at periods of abrupt climate change. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.  HU, SO

* EVST 040a, Collections of the Peabody Museum  David Skelly
Exploration of scientific questions through the study and analysis of objects within the Peabody Museum’s collections. Formulating a research question and carrying out a project that addresses it are the core activities of the course. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.  SC

* EVST 060b, Topics in Environmental Justice  Michael Fotos
This seminar introduces students to key concepts in environmental justice and to a selection of cases representing a wide range of environmental dilemmas. Course readings and discussions impart awareness of the diverse contexts in which problems of environmental justice might be studied, whether historical, geographic, racial, social, economic, political, biological, geophysical, or epistemic. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.  WR, SO

* EVST 100b / APHY 100b / ENAS 100b / EPS 105b / PHYS 100b, Energy, Environment, and Public Policy  Daniel Prober
The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science.  QR, SC

EVST 127a / ER&M 127a / SOCY 127a / WGSS 127a, Health and Illness in Social Context  Alka Menon
Present-day medicine and health care provide solutions to an ever-increasing array of human problems. Yet the achievement of health can be elusive. This course provides a broad introduction to the domains of health and illness in the U.S., with some coverage of international trends and topics. Students analyze how our personal health and public health are shaped by social structures, political struggles, expert knowledge, and medical markets. Topics include the cultural and social meanings associated with health and illness; inequalities in health and health care access and provision; controversies surrounding healthcare, medical knowledge production, and medical decision-making; and the social institutions of the health care industry.  HU, SO

EVST 159b / HIST 246b, The History of Food  Paul Freedman
The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts.  HU

EVST 196a / AFAM 196a / AMST 196a / ER&M 226a / SOCY 190a, Race, Class, and Gender in American Cities  Staff
Examination of how racial, gender, and class inequalities have been built, sustained, and challenged in American cities. Focus on the twentieth and twenty-first centuries. Topics include industrialization and deindustrialization, segregation, gendered public/private split, gentrification, transit equity, environmental justice, food access, and the relationships between public space, democracy, and community well-being. Includes field projects in New Haven.  SO o Course cr

EVST 211b / EPS 211b / HIST 416b / HSHM 211b, Global Catastrophe since 1750  Bill Rankin
A history of the geological, atmospheric, and environmental sciences, with a focus on predictions of global catastrophe. Topics range from headline catastrophes such as global warming, ozone depletion, and nuclear winter to historical debates about the age of the Earth, the nature of fossils, and the management of natural resources. Tensions between science and religion; the role of science in government; environmental economics; the politics of prediction, modeling, and incomplete evidence.  HU

* EVST 212a / EP&E 390a / PLSC 212a, Democracy and Sustainability  Michael Fotos
Democracy, liberty, and the sustainable use of natural resources. Concepts include institutional analysis, democratic consent, property rights, market failure, and common pool resources. Topics of policy substance are related to human use of the environment and to U.S. and global political institutions.  WR, SO

* EVST 259b / ENGL 459b / MRRB 459b, Writing about Science, Medicine, and the Environment  Carl Zimmer
Advanced non-fiction workshop in which students write about science, medicine, and the environment for a broad public audience. Students read exemplary work, ranging from newspaper articles to book excerpts, to learn how to translate complex subjects into compelling prose. Admission by permission of the instructor only. Applicants should email the instructor at carl@carlzimmer.com with the following information: 1. One or two samples of nonacademic, nonfiction writing. (No fiction or scientific papers, please.) Indicate
the course or publication, if any, for which you wrote each sample. 2. A note in which you briefly describe your background (including writing experience and courses) and explain why you'd like to take the course. **WR RP**

**EVST 219a / PHIL 290a, Philosophical Environmental Ethics**  
Stephen Latham  
This is a philosophical introduction to environmental ethics. The course introduces students to the basic contours of the field and to a small number of special philosophical problems within the field. No philosophical background is required or expected. Readings are posted on Canvas and consist almost entirely of contemporary essays by philosophers and environmentalists. **SO**

**EVST 223a / E&EB 220a, General Ecology**  
David Vasseur and Carla Staver  
The theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions at broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious diseases are placed in an ecological context. Prerequisite: MATH 112 or equivalent. **SC**

* **EVST 224a / ENGL 418a, Writing About The Environment**  
Alan Burdick  
Exploration of ways in which the environment and the natural world can be channeled for literary expression. Reading and discussion of essays, reportage, and book-length works, by scientists and non-scientists alike. Students learn how to create narrative tension while also conveying complex—sometimes highly technical—information; the role of the first person in this type of writing; and where the human environment ends and the non-human one begins. Formerly ENGL 241. Admission by permission of the instructor only. Students interested in the course should email the instructor at alan.burdick@gmail.com with the following information: 1.) A few paragraphs describing your interest in taking the class. 2.) A non-academic writing sample that best represents you. **WR**

* **EVST 227b, Energy and Environmental Policy Solutions for the Anthropocene**  
Robert Klee  
Study of innovative energy and environmental policy solutions for the problems of the Anthropocene—the new epoch of human dominance of the earth. Students explore policies for effective deployment of renewables, smart grids, corporate responsibility, emerging contaminants, zero emission vehicles, environmental information disclosure, carbon sequestration, climate adaptation, sustainable cities, and environmental education. Students critically examine these policies through the lenses of equity and environmental justice, economic impacts (positive and negative), co-benefits, communication, legal governance systems, and politics. **SC**

* **EVST 228a / HIST 450ja / HUMS 228a / LITR 345a, Climate Change and the Humanities**  
Katja Lindskog  
What can the Humanities tell us about climate change? The Humanities help us to better understand the relationship between everyday individual experience, and our rapidly changing natural world. To that end, students read literary, political, historical, and religious texts to better understand how individuals both depend on, and struggle against, the natural environment in order to survive. **HU**

* **EVST 234La, Field Science: Environment and Sustainability**  
Kaeloha Freidenburg  
A field course that explores the effects of human influences on the environment. Analysis of pattern and process in forested ecosystems; introduction to the principles of agroecology, including visits to local farms; evaluation of sustainability within an urban environment. Weekly field trips and one weekend field trip. **SC**

* **EVST 244a, Coastal Environments in a Changing World**  
Mary Beth Decker  
The effects of human action and natural phenomena on coastal marine ecosystems. Methods used by coastal scientists to address environmental issues; challenges associated with managing and conserving coastal environments. Priority to Environmental Studies majors; open to nonmajors as space permits. **SC**

* **EVST 255b / F&ES 255b / GLBL 282b / PLSC 215b, Environmental Law and Politics: Global Food Challenges**  
John Wargo  
We explore relations among food, environment, health, and law. We consider global-scale avoidable challenges such as: starvation and malnutrition, obesity, other food related human diseases, climate instability, soil loss, water depletion and contamination, microbial hazards, chemical contamination, food waste, dietary convergence, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We focus on laws that influence the world's food system, including those intended to reduce or prevent environmental and health damages. Other laws protect rights of secrecy, property, speech, confidential business information, free trade, worker protection, equal opportunity, and freedom from discrimination. Ethical concerns of justice, equity, and transparency are prominent themes. Examples of effective law, consumer movements and corporate innovations provide optimism for the future of responsible food. **SO**

* **EVST 290b / F&ES 290b, Geographic Information Systems**  
Charles Tomlin  
A practical introduction to the nature and use of geographic information systems (GIS) in environmental science and management. Applied techniques for the acquisition, creation, storage, management, visualization, animation, transformation, analysis, and synthesis of cartographic data in digital form. **SO**

**EVST 292a / GLBL 217a / PLSC 149a, Sustainability: Environment, Energy, and the Economy in the 21st Century**  
Daniel Esty  
Sustainability as a guiding concept for addressing twenty-first century tensions between economic, environmental, and social progress. Using a cross-disciplinary set of materials from the “sustainability canon,” students explore the interlocking challenges of providing abundant energy, reducing pollution, addressing climate change, conserving natural resources, and mitigating the other impacts of economic development. **SO**

* **EVST 299b, Sustainable Development Goals and Implementation**  
Gordon Geballe  
Students develop an understanding of the United Nation's Sustainable Development Goals (SDGs), and focus on how to manage projects that implement the SDGs. Students develop an understanding of the global sustainability agenda, studying each SDG in detail. Students
explore and acquire practical project management skills. The course also taps into the expertise and experience of professors and staff from various disciplines and schools, as well as practitioners directly from the field.

* **EVST 301b / AMST 348b / ER&M 381b, Space, Place, and Landscape**  Laura Barracough
Survey of core concepts in cultural geography and spatial theory. Ways in which the organization, use, and representation of physical spaces produce power dynamics related to colonialism, race, gender, class, and migrant status. Multiple meanings of home; the politics of place names; effects of tourism; the aesthetics and politics of map making; spatial strategies of conquest. Includes field projects in New Haven.  **SO**

**EVST 318b / AMST 236b / HIST 199b / HSHM 207b, American Energy History**  Paul Sabin
The history of energy in the United States from early hydropower and coal to present-day hydraulic fracturing, deepwater oil, wind, and solar. Topics include energy transitions and technological change; energy and democracy; environmental justice and public health; corporate power and monopoly control; electricity and popular culture; labor struggles; the global quest for oil; changing national energy policies; the climate crisis.  **WR, HU**

* **EVST 323a, Wetlands Ecology Conservation & Management**  Kealoha Freidenburg
Wetlands are ubiquitous. Collectively they cover 370,000 square miles in the United States and globally encompass more than 5 million square miles. Most points on a map are less than 1 km from the nearest wetland. Yet wetlands are nearly invisible to most people. In this course we explore wetlands in all of their dimensions, including the critical services they provide to other systems, the rich biodiversity they harbor, their impact on global climate, and the links by which they connect to other systems. Additionally, wetlands are lynchpin environments for scientific policy and regulation. The overarching aim of the course is to connect what we know about wetlands from a scientific perspective to the ways in which wetlands matter for people.  **SC**

* **EVST 324a / ANTH 322a / SAST 306a, Environmental Justice in South Asia**  Kalyanakrishnan Shivaramakrishnan
Study of South Asia’s nation building and economic development in the aftermath of war and decolonization in the 20th century. How it generated unprecedented stress on natural environments; increased social disparity; and exposure of the poor and minorities to environmental risks and loss of homes, livelihoods, and cultural resources. Discussion of the rise of environmental justice movements and policies in the region as the world comes to grips with living in the Anthropocene.  **SO**

**EVST 340a / ECON 330a, Economics of Natural Resources**  Robert Mendelsohn
Microeconomic theory brought to bear on current issues in natural resource policy. Topics include regulation of pollution, hazardous waste management, depletion of the world’s forests and fisheries, wilderness and wildlife preservation, and energy planning. After introductory microeconomics.  **QR, SO**

**EVST 347a, Introduction to Environmental Chemistry**  Gaboury Benoit
Introduction to environmental chemistry and to the nature and behavior of environmental pollutants, including chemical, biological, and physical processes. The fundamental classes of chemical reactions in the environment; critical analysis of chemical data; sampling techniques; analytical methods; natural biogeochemical controls on environmental chemistry. Case studies examine contaminants of special interest such as acid precipitation, nutrients, and sewage.  **SC**

* **EVST 350a, Writing the World**  Verlyn Klinkenborg
This is a practical writing course meant to develop the student’s skills as a writer. But its real subject is perception and the writer’s authority—the relationship between what you notice in the world around you and what, culturally speaking, you are allowed to notice. What you write during the term is driven entirely by your own interest and attention. How you write is the question at hand. We explore the overlapping habitats of language—present and past—and the natural environment. And, to a lesser extent, we explore the character of persuasion in environmental themes. Every member of the class writes every week, and we all read what everyone writes every week. It makes no difference whether you are a would-be journalist, scientist, environmental advocate, or policy maker. The goal is to rework your writing and sharpen your perceptions, both sensory and intellectual. Enrollment limited to fifteen.  **WR**

* **EVST 351b / NELC 309b, The Anthropocene**  Harvey Weiss
“The Anthropocene” is the recent and informal designation for the period during which human activity has transformed the Earth. The Anthropocene is now the subject of intense research and debate among environmental historians, archaeologists, botanists, and climate system modelers. The reasons for this are clear: we need to know the history of the Earth’s transformation(s) in order to understand present rates of atmospheric, climatic, environmental, demographic, land use, and biodiversity change. What were the magnitudes and rates of these changes, individually or synchronously, over the past 10,000 years? 4000 years? 100 years? Are these rates of change “normal,” unusual, benign, unimportant, or “dangerous?”  **SO**

* **EVST 362b / ARCG 362b / EPS 362b, Observing Earth from Space**  Xuhui Lee
A practical introduction to satellite image analysis of Earth’s surface. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, the merging of satellite imagery with GIS and applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, archaeology, and watershed management. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy.  **QR, SC**

* **EVST 377b / ANTH 376b, Observing and Measuring Behavior**  Eduardo Fernandez-Duque
Survey of theoretical issues and practical methods relevant to the study of animal and human behavior, primarily in the wild. Topics include research design, behavioral and ecological sampling protocols, basic methods for data analysis, including simple descriptive and
analytical statistics, and widely-used technologies that facilitate the study of behavior, such as radiotelemetry. Working around a specific research question, students design their own behavioral study. Prerequisite: Course in evolutionary biology or in the study of animal behavior. SC, SO

EVST 394b, Current Topics in Global Climate Change  A. Scott Denning
People are currently mining millions of years’ worth of stored photosynthetic carbon from the solid Earth and transferring it to the atmosphere where it is profoundly changing the chemistry, physics, and biology of the atmosphere, land, and oceans. Exchanges with the oceans and land surface have been modified substantially, so that currently only about half of anthropogenic emissions remain in the atmosphere. These “carbon sinks” are poorly understood, contributing a great deal of uncertainty to future climate. We consider biogeochemical and transport processes in land ecosystems, the oceans, and atmosphere as well as anthropogenic emissions. We conclude with a study of changes in carbon cycling in the past and future, including predictions by coupled Earth System Models. SO

* EVST 396a or b, Independent Study: Environmental Studies  Michael Fotos
Independent research under the direction of a Yale faculty member on a special topic in Environmental Studies not covered in other courses and not the focus of the senior essay. Permission of the director of undergraduate studies and of the instructor directing the research is required. A proposal approved by the instructor must be submitted to the director of undergraduate studies by the end of the second week of classes. The instructor meets with the student regularly, in person or remotely, typically for an hour a week, and the student writes a final paper or a series of short essays. SC

* EVST 409b / ENGL 341b, Nature Poetry, from the Classics to Climate Change  Jonathan Kramnick
Poetry of the natural world, beginning with classical pastoral and ending with lyric responses to climate change. We consider how poetry attempts to make sense of our interaction with the earth at important moments of change, from pre-industrial agriculture to global capitalism and the Anthropocene. WR, HU

* EVST 415b / BENG 405b, Biotechnology and the Developing World  Anjelica Gonzalez
Study of technological advances that have global health applications. Ways in which biotechnology has enhanced quality of life in the developing world. The challenges of implementing relevant technologies in resource-limited environments, including technical, practical, social, and ethical aspects. Prerequisite: MCDB 120, or BIOL 101 and 102.

* EVST 422a / ANTH 409a / ER&M 394a / F&ES 422a / GLBL 394a, Climate and Society from Past to Present  Michael Dove
Discussion of the major currents of thought—both historic and contemporary—regarding climate, climate change, and society; focusing on the politics of knowledge and belief vs disbelief; and drawing on the social sciences and anthropology in particular. WR, SO

EVST 429b, Caribbean Coastal Development: Science and Policy  Gaboury Benoit and Mary Beth Decker
This seminar explores human-ecosystem interactions at the land-sea interface in the tropics, with Caribbean islands as the main study sites. Many tropical islands are undergoing rapid, uncontrolled development, placing severe local stress on several unique and vulnerable ecosystems types. In addition, human induced environmental changes on scales up to global also impose stresses. This course examines the normal functioning of these ecosystems, scientific methods to evaluate and characterize ecosystem condition and processes, how human activities interfere with natural cycles in biophysical systems, and what management and policy tools can be applied to reduce impacts. SC, SO

EVST 431b, The Physical Science of Climate Change  Peter Raymond and Xuhui Lee
The course provides students with core knowledge on the processes controlling the earth’s climate system. The first half of the class focuses on the four components of the earth climate system, providing a knowledge base on the atmospheric energy and water budgets and the roles of anthropogenic greenhouse gases, the oceans, land and cryosphere in altering these budgets. Students also learn how to run a climate GCM (general circulation model). The second half of the class focuses on impacts of climate change on a number of societal sectors including natural ecosystems, energy use, water resources, the food system and the built environment. SC

* EVST 444b / F&ES 344b, Aquatic Chemistry  Gaboury Benoit
A detailed examination of the principles governing chemical reactions in water. Emphasis on developing the ability to predict the aqueous chemistry of natural, engineered, and perturbed systems based on a knowledge of their biogeochemical setting. Calculation of quantitative solutions to chemical equilibria. Focus on inorganic chemistry. Topics include elementary thermodynamics, acid-base equilibria, alkalinity, speciation, solubility, mineral stability, redox chemistry, and surface complexation reactions. SC

* EVST 454b / PLSC 454b, Data Science for Politics and Policy  Fredrik Sävje
Data plays an increasingly important role in policy making and politics. The ability to draw valid conclusions from quantitative information can tilt elections or be the difference between a successful or failed policy. This course teaches how to use tools from statistics, data science, and machine learning to solve problems and challenges faced in policy making and politics. Students learn how data can help people make campaign decisions, detect election fraud, predict election outcomes, and investigate if a policy had the intended effect. Students receive an introduction to statistical programming in R, supervised and unsupervised machine learning, and causal inference. QCR, SO

* EVST 463a / AMST 463a / FILM 452a / THST 457a, Documentary Film Workshop  Charles Musser
A yearlong workshop designed primarily for majors in Film and Media Studies or American Studies who are making documentaries as senior projects. Seniors in other majors admitted as space permits. RP
* EVST 473a / ANTH 473a / ARCG 473a / NELC 473a, Climate Change, Societal Collapse, and Resilience  Harvey Weiss
The coincidence of societal collapses throughout history with decadal and century-scale abrupt climate change events. Challenges to anthropological and historical paradigms of cultural adaptation and resilience. Examination of archaeological and historical records and high-resolution sets of paleoclimate proxies.  HU, SO

* EVST 496a or b, Senior Research Project and Colloquium  Michael Fotos, Robert Klee, Jeffrey Park, and Kealoha Freidenburg
Independent research under the supervision of members of the faculty, resulting in a senior essay. Students meet with peers and faculty members regularly throughout the fall term to discuss the progress of their research. Projects should offer substantial opportunity for interdisciplinary work on environmental problems. Students typically complete a two-term senior essay, but students completing the requirements of two majors may consider a one-term senior project.