ENVIRONMENTAL 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 030b / ARCG 031b / NELC 026b, 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 123a / ENAS 123a, You, Your Planet, and A Sustainable Future  Aaron Dollar
This course attempts to give a holistic view of the major inter-relationships between
humans and our planet, along with an examination of options for paths to a future that
is more sustainable. It seeks to be personal and practical where possible, with a strong
focus on ways that individuals can make a difference in their daily lives to the pressing
issues around the climate and biodiversity crises. We examine concepts primarily
through simple, fundamental physical principles which help to “see the forest for the
trees” without getting bogged down by complex details. SC
EVST 189b / 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  0 Course cr

EVST 191b, Trees: Environmental Biology and Global Significance  Craig Brodersen
This introductory level course explores the fundamental physiological and anatomical principles that govern tree biology. We cover the biophysics of energy balance, long-distance water transport, and gas exchange at multiple scales, from individual plant cells and organs to the tree and forest canopy. Understanding these processes requires foundational knowledge in the principles of cells and membranes, the fundamental differences between plant and animal cells, reproductive cycles, nutrient cycling, and phenology. Our focus then turns to regional and global patterns in forest dynamics, the implications of disruptions in the biotic and abiotic environment, and the role that trees play in the carbon cycle and carbon sequestration. We also consider the cultural significance of trees and forest products, with explorations of wood use in musical instruments and building materials  SC

* 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 215b / ENGL 459b / MB&B 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 219b / PHIL 290b, 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  0 Course cr

EVST 223a / E&EB 220a, General Ecology  David Vasseur
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 0 Course cr

* 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 234La, Field Science: Environment and Sustainability  Kealoha 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 247a / EP&E 497a / PLSC 219a, Politics of the Environment  Peter Swenson
Historical and contemporary politics aimed at regulating human behavior to limit damage to the environment. Goals, strategies, successes, and failures of movements, organizations, corporations, scientists, and politicians in conflicts over environmental policy. A major focus is on politics, public opinion, corporate interests, and litigation in the U.S. regarding climate change. SO

* EVST 255b / F&ES 255b / GLBL 282b / PLSC 215b, Environmental Law and Politics  John Wargo
We explore relations among environmental quality, health, and law. We consider global-scale avoidable challenges such as: environmentally related human illness, climate instability, water depletion and contamination, food and agriculture, air pollution, energy, packaging, culinary globalization, and biodiversity loss. We evaluate the effectiveness of laws and regulations intended to reduce or prevent environmental and health damages. Additional laws considered include rights of secrecy, property, speech, worker protection, and freedom from discrimination. Comparisons among the US and EU legal standards and precautionary policies will also be examined. Ethical concerns of justice, equity, and transparency are prominent themes. SO 0 Course cr

* EVST 257b / CLCV 258b / HIST 201b, Ecocultures of Antiquity: Ecocritical Approaches to Ancient Greece and Rome  Kirk Freudenburg
This class examines how the Greeks and Romans exploited their natural surroundings not only as physical resources, but as resources for human thought. The focus is on how ancient thinkers, living lives that were largely city-bound and detached from nature, structured their thoughts about the lives they lived (and about human existence more generally) by reference to their nonhuman surroundings: creatures, plants and places, some of which existed in the real world (in places far off, largely unknown and elsewhere; in places penetrated, explored, and/or told of), others of which existed entirely in the imagination, whether as inherited lore, or as places and creatures invented ad hoc by individuals and groups to get certain kinds of cultural
work done. We look not only at the how and what, but at the why of nature’s encoding via culture, and vice versa (their symbiosis), paying special attention to ancient Rome (though with a short first glance at Homer, Hesiod and Aristotle). We begin by scrutinizing the categories themselves, attempting to find historically appropriate ways to connect modern ecocritical concerns and ways of thought to the ancient world. Topics include: the cosmos, the heavens, and the first humans (and first peoples in their places); humans in their ‘kinds’ and animals, wild and tame; mountains, rivers, the sea and the undersea; human and animal foods, farming and food ways; wine and fermentation; groves, forests and trees; gardens, flowers, vegetables and fungi; birds, fish, weasels and snakes; earthquakes, floods and natural disasters; pollution, dirt and the city of Rome; the ecocultural lives of others.  

* EVST 258b / AMST 258b / ER&M 258b / HSAR 258b, Wilderness in the North American Imagination  
Alison Kibbe  
Framing the terms “wilderness” and “North America” expansively, this seminar examines the construction of and the relationships between the human and the non-human in the “New World” through the lens of the conquest encounter and its ongoing impacts. We approach “North America” as a construct that we cannot disentangle from the construction of the Americas as a whole. We unpack how concepts such as wilderness, nature, wild, tame, and human are deeply imbricate with the construction of race, gender, and capitalism and cannot be understood outside of the historical and cultural context of the conquest of the Americas. This interdisciplinary course is grounded in Black studies, Black geographies, mobility studies, food studies, and Black and Indigenous understandings of the other-than-human. We consider academic texts, literature, performance, creative production, and community projects as intellectual production and theoretical interventions. Through field trips and special guests we connect with local Black and Indigenous agricultural producers and outdoor educators working in New England and learn how multi-modal and community-engaged scholarship can offer models for critical intervention and healing. This course requires permission from the instructor. Email alison.kibbe@yale.edu.  

* EVST 261a / EPS 261a / F&ES 261a, Minerals and Human Health  
Ruth Blake  
Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; EPS 110 recommended.  

* EVST 265b / EPS 255b, Environmental Geomicrobiology  
Ruth Blake  
Microbial diversity in natural geologic habitats and the role of microorganisms in major biogeochemical cycles. Introduction to prokaryote physiology and metabolic diversity; enrichment culture and molecular methods in geomicrobiology. Prerequisite: college-level chemistry.  

* EVST 290b / URBN 319b, 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.
* **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 304a / AMST 348a / ER&M 381a, Space, Place, and Landscape**  Kristin Hankins
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.  

**EVST 307b, Organic Pollutants in the Environment**  Shimon Anisfeld
An overview of the pollution problems posed by toxic organic chemicals, including petroleum, pesticides, PCBs, dioxins, chlorinated solvents, and emerging contaminants such as PFAS, personal care products, and brominated compounds. The course covers the processes governing the environmental fate of organic pollutants (e.g., evaporation, bioconcentration, sorption, biodegradation, migration in groundwater), as well as tools for the prevention and remediation of organic pollution. Previous knowledge of organic chemistry is not required (but is welcome).  

* **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.  

* **EVST 324b / ANTH 322b / SAST 306b, Environmental Justice in South Asia**  Kalyanakrishnan Sivaramakrishnan
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.  

**EVST 340a / ECON 330a, Economics of Natural Resources**  Staff
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 o Course cr
* EVST 349b / HIST 449Jb / HSHM 449b / URBN 382b, Critical Data Visualization: History, Theory, and Practice  Bill Rankin
Critical analysis of the creation, use, and cultural meanings of data visualization, with emphasis on both the theory and the politics of visual communication. Seminar discussions include close readings of historical data graphics since the late eighteenth century and conceptual engagement with graphic semiology, ideals of objectivity and honesty, and recent approaches of feminist and participatory data design. Course assignments focus on the research, production, and workshop of students’ own data graphics; topics include both historical and contemporary material. No prior software experience is required; tutorials are integrated into weekly meetings. Basic proficiency in standard graphics software is expected by the end of the term, with optional support for more advanced programming and mapping software.  HU

* 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 354b / ANTH 331b / ARCG 000 / ARCG 354b / HIST 204Jb / NELC 000 / NELC 324b, The Ancient State: Genesis and Crisis from Mesopotamia to Mexico  Harvey Weiss
Ancient states were societies with surplus agricultural production, classes, specialization of labor, political hierarchies, monumental public architecture and, frequently, irrigation, cities, and writing. Pristine state societies, the earliest civilizations, arose independently from simple egalitarian hunting and gathering societies in six areas of the world. How and why these earliest states arose are among the great questions of post-Enlightenment social science. This course explains (1) why this is a problem, to this day, (2) the dynamic environmental forces that drove early state formation, and (3) the unresolved fundamental questions of ancient state genesis and crisis, –law-like regularities or a chance coincidence of heterogenous forces?  HU, SO

EVST 360a, Forest Dynamics  Marlyse Duguid
This course introduces the study of forest stand dynamics—how forest structures and compositions change over time with growth and disturbances. Understanding the dynamic nature of forest stands is important for creating and maintaining a variety of critical ecosystem services sustainably and synergistically, including sustainable supplies of wood products, biodiversity and wildlife habitats, water, fire protection, and others. Through readings, lectures, discussions, and field trips we explore forest development processes and pathways, concentrating on the driving mechanisms and emergent properties including natural and human disturbances. We make use of New England forests as living laboratories while discussing how similar forest patterns and processes are played out throughout the temperate, tropical, and boreal worlds. This
class is designed to be accessible to anyone interested in an in-depth exploration of forest ecosystems. Some background in biology or ecology is helpful, but not necessary.

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 369a / AFST 368a / HIST 366Ja, Commodities of Colonialism in Africa  Robert Harms
This course examines historical case studies of several significant global commodities produced in Africa to explore interactions between world market forces and African resources and societies. Through the lens of four specific commodities—ivory, rubber, cotton, and diamonds—this course evaluates diverse industries and their historical trajectories in sub-Saharan Africa within a global context from ~1870-1990s. Students become acquainted with the historical method by developing their own research paper on a commodity using both primary and secondary sources.  WR, HU

EVST 378a / AFST 378a / S&DS 138a, Foreign Assistance to Sub-Saharan Africa: Archival Data Analysis  Russell Barbour
This course reviews the many years of U.S. development assistance to Africa using archival data from the Agency for International Development (USAID), nonprofit organizations, and specialized agencies such as the U.S. Department of Agriculture and nineteen U.S. government agencies involved in development assistance to Africa. Students analyze the effectiveness, perception, and shifting development paradigms of such assistance, looking at four specific areas: agriculture, water and sanitation, child survival, and refugee relief. Advanced text-mining analysis in the R package tm and web-scrapping algorithms in Python are applied to both archival and current data to enhance analysis.  SO

EVST 379a / ANTH 377a, Observing and Measuring Behavior, Part II: Data Analyses and Reporting  Eduardo Fernandez-Duque
This is the second course in a spring-fall sequence. The course is primarily for students who have already taken "Observing and Measuring Behavior I: Study Design" (ANTH 376) and who have conducted summer research as part of an NSF-funded Summer Program in Argentina (https://www.owlmonkeyproject.com/open-calls). In this course students learn how to analyze the data they have collected, strategies for interpreting and presenting results, including considerations of study design issues and a priori statistical protocols; predictive and/or explanatory power and interpretation of statistical significance, scientific inference and research relevance. Students practice writing and oral skills associated with how to write communicating the results of their study. Prerequisite: ANTH 376.  QR, SC, SO

EVST 400b / E&EB 275b, Biological Oceanography  Mary Beth Decker
Exploration of a range of coastal and pelagic ecosystems. Relationships between biological systems and the physical processes that control the movements of water and
productivity of marine systems. Anthropogenic impacts on oceans, such as the effects of fishing and climate change. Includes three Friday field trips. Enrollment limited to 15.

* 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: Perspectives from the Social Sciences and Humanities  
  Michael Dove
Discussion of the major currents of thought regarding climate and climate change; focusing on equity, collapse, folk knowledge, historic and contemporary visions, western and non-western perspectives, drawing on the social sciences and humanities. WR, SO

* EVST 430a / AMST 425a / ENGL 283a, American Culture and the Rise of the Environment  
  Michael Warner
U.S. literature from the late eighteenth century to the Civil War explored in the context of climate change. Development of the modern concept of the environment; the formation and legacy of key ideas in environmentalism; effects of industrialization and national expansion; utopian and dystopian visions of the future. Formerly ENGL 430. WR, HU

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 463a / AMST 463a / FILM 455a / 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 496a or b, Senior Research Project and Colloquium  
  Jeffrey Park and Staff
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. Seniors in the BS track typically write a two semester senior essay by enrolling in EVST 496 and EVST 496. For the B.A. degree, students most often complete one term of EVST 496, in either the fall or spring semester of their senior year. Students writing the one-term essay in the BA track must also complete an additional advanced seminar in the environment.
Two-term senior research projects in the BA track require the permission of the DUS. Single semester essays are permissible also for students completing a double major that involves writing a senior essay in another department or program with permission of the DUS and subject to Yale College academic regulations governing completion of two majors.