

Sustainability Focused courses offered in 2014-2015 – For AASHE STARS credit AC-1

1. **ES 101. Introduction to Environmental Studies.** Every fall. MATTHEW KLINGLE AND JOHN LICHTER. An interdisciplinary introduction from the perspectives of the natural sciences, the social sciences, and moral philosophy to the variety of environmental problems confronting us today. Provides an overview of the state of scientific knowledge about major environmental problems, both global and regional, an analysis of the ethical problems they pose, potential responses of governments and individuals, and an exploration of both the successes and the inadequacies of environmental policy. Topics include air pollution, fisheries, and chemicals in the environment as well as global population, climate change, energy, and sustainability.
2. **EOS200/ES200 Biogeochemistry: An Analysis of Global Change.** Every fall. Fall 2014. PHILIP CAMILL. Understanding global change requires knowing how the biosphere, geosphere, oceans, ice, and atmosphere interact. An introduction to earth system science, emphasizing the critical interplay between the physical and living worlds. Key processes include energy flow and material cycles, soil development, primary production and decomposition, microbial ecology and nutrient transformations, and the evolution of life on geochemical cycles in deep time. Terrestrial, wetland, lake, river, estuary, and marine systems are analyzed comparatively. Applied issues are emphasized as case studies, including energy efficiency of food production, acid rain impacts on forests and aquatic systems, forest clear cutting, wetland delineation, eutrophication of coastal estuaries, ocean fertilization, and global carbon sinks. Lectures and three hours of laboratory or fieldwork per week.
3. **ES 201/Bio 158/Chem105. Perspectives in Environmental Science.** Every spring. PHILIP CAMILL AND DHARNI VASUDEVAN. Functioning of the earth system is defined by the complex and fascinating interaction of processes within and between four principal spheres: land, air, water, and life. Leverages key principles of environmental chemistry and ecology to unravel the intricate connectedness of natural phenomena and ecosystem function. Fundamental biological and chemical concepts are used to understand the science behind the environmental dilemmas facing societies as a consequence of human activities. Laboratory sessions consist of local field trips, laboratory experiments, group research, case study exercises, and discussions of current and classic scientific literature
4. **ES 203/History 242. Environment and Culture in North American History.** Every spring. CONNIE CHIANG OR MATTHEW KLINGLE. Spring 2015. Matthew Klinge. Explores relationships between

ideas of nature, human transformations of the environment, and the effect of the physical environment upon humans through time in North America. Topics include the “Columbian exchange” and colonialism; links between ecological change and race, class, and gender relations; the role of science and technology; literary and artistic perspectives of “nature”; agriculture, industrialization, and urbanization; and the rise of modern environmentalism. Assignments include a research-based service learning term project.

5. **ES 221/Soc 221. Environmental Sociology.** Spring 2015. SHAUN GOLDING Applies sociological insights to investigating the ways that humans shape and are shaped by their ecological surroundings. Introduces theories and concepts for exploring how western society and more specifically contemporary American society interact with nature. Reviews central academic questions, including social constructions of nature and perceptions of ecological risks, and drawing from complementary readings and student-led dialogue, examines in greater depth ongoing struggles over conservation, sustainability, development, and social justice.
6. **ES 228/Economics 228. Natural Resource Economics and Policy.** Spring 2015 GUILLERMO HERRERA A study of the economic issues surrounding the existence and use of renewable natural resources (e.g., forestry/land use, fisheries, water, ecosystems, and the effectiveness of antibiotics) and exhaustible resources (such as minerals, fossil fuels, and old growth forest). A basic framework is first developed for determining economically efficient use of resources over time, then extended to consider objectives other than efficiency, as well as the distinguishing biological, ecological, physical, political, and social attributes of each resource. Uncertainty, common property, and various regulatory instruments are discussed, as well as alternatives to government intervention and/or privatization.
7. **ES 263/Gov 238. Comparative Environmental Politics.** Spring 2015 LAURA A. HENRY Examines environmental politics from a comparative perspective, drawing on case material from the United States, Europe, Latin America, Africa, and Asia. Asks why, despite the fact that many contemporary environmental problems are shared globally, states develop different environmental policies. Readings cover issues ranging from forest conservation to climate policy and consider explanatory factors such as type of political regime, level of economic development, activism by citizens, and culture and values.
8. **ES 281/Bio 281. Forest Ecology and Conservation.** Fall 2014. VLADIMIR DOUHOVNIKOFF An examination of how forest ecology and the principles of silviculture inform forest ecosystem restoration and conservation. Explores ecological dynamics of forest ecosystems, the science of managing forests for tree growth and other goals, natural history and historic use of forest

resources, the state of forests today, as well as challenges and opportunities in forest restoration and conservation. Consists of lecture, discussions, field trips, and guest seminars by professionals working in the field.

9. **ES302/EOS 302. Earth Climate History.** Spring 2015. PHILIP CAMILL The modern world is experiencing rapid climate warming and some parts extreme drought, which will have dramatic impacts on ecosystems and human societies. How do contemporary warming and aridity compare to past changes in climate over the last billion years? Are modern changes human-caused or part of the natural variability in the climate system? What effects did past changes have on global ecosystems and human societies? Students use environmental records from rocks, soils, ocean cores, ice cores, lake cores, fossil plants, and tree rings to assemble proxies of past changes in climate, atmospheric CO₂, and disturbance to examine several issues: long-term carbon cycling and climate, major extinction events, the rise of C4 photosynthesis and the evolution of grazing mammals, orbital forcing and glacial cycles, glacial refugia and post-glacial species migrations, climate change and the rise and collapse of human civilizations, climate/overkill hypothesis of Pleistocene megafauna, climate variability, drought cycles, climate change impacts on disturbances (fire and hurricanes), and determining natural variability vs. human-caused climate change.

10. **ECON/ES 2228 {228} b - MCSR. Natural Resource Economics and Policy.** Spring 2015. GUILLERMO HERRERA A study of the economic issues surrounding the existence and use of renewable natural resources (e.g., forestry/land use, fisheries, water, ecosystems, and the effectiveness of antibiotics) and exhaustible resources (such as minerals, fossil fuels, and old growth forest). A basic framework is first developed for determining economically efficient use of resources over time, then extended to consider objectives other than efficiency, as well as the distinguishing biological, ecological, physical, political, and social attributes of each resource. Uncertainty, common property, and various regulatory instruments are discussed, as well as alternatives to government intervention and/or privatization. (Same as Environmental Studies 2303 {228}.)

11. **ES 1026/Soc 1026 Landscape, Energy, and Culture** Fall 2014 SHAUN GOLDING Explores current controversies in energy, giving particular attention to debates surrounding the implementation of renewable energy in northern New England. Through both popular and scholarly readings and one mandatory field trip, engages with critical perspectives on consumer-oriented culture and identities and on tensions between urban and rural visions of landscape. Contemplates the social structures governing regional development and planning in which renewable energy strategies are framed.

12. **Asian Studies 2075/ES 2475/Cin 2075 Ecocinema: China's Ecological and Environmental Crisis** Spring 2015 SHU-CHIN TSUI. Examines how China's economic development has caused massive destruction to the natural world and how environmental degradation affects the lives of ordinary people. An ecological and environmental catastrophe unfolds through the camera lens in feature films and documentaries. Central topics include the interactions between urbanization and migration, humans and animals, eco-aesthetics and manufactured landscapes, local communities and globalization. Considers how cinema, as mass media and visual medium, provides ecocritical perspectives that influence ways of seeing the built environment. The connections between cinema and environmental studies will enable students to explore across disciplinary as well as national boundaries. *Note:* Fulfills the film theory requirement for cinema studies minors.

13. **2301 {207} b - MCSR. Building Resilient Communities.** Fall 2014. EILEEN JOHNSON. Examines efforts by communities and regions to build resilience in the face of changing environmental and social conditions. Examines how local leaders can work in complex settings to set goals and mobilize federal, private, and non-profit resources to achieve specific, cross-cutting objectives that include strengthening local economies, safeguarding important environmental values, protecting public health, and addressing issues of economic and social justice. Provides students with firsthand understanding of how Geographic Information Systems (GIS) play an increasingly important role in understanding and informing effective approaches for expanding resilience at a community level by integrating social and natural data to inform policy decision. Students learn GIS as part of the course.

Sustainability Related courses offered in 2014-2015 – For AASHE STARS credit AC-1

1. **MATH 1050 {50} Quantitative Reasoning.** Every semester. Fall 2014. Eric Gaze and Miriam Logan. Spring 2015. Miriam Logan.
Explores the ways and means by which we communicate with numbers; the everyday math we encounter on a regular basis. The fundamental quantitative skill set is covered in depth, providing a firm foundation for further coursework in mathematics and the sciences. Topics include ratios, rates, percentages, units, descriptive statistics, linear and exponential modeling, correlation, logic, and probability. A project-based course using Microsoft Excel, emphasizing conceptual understanding and application. Reading of current newspaper articles and 236 exercises involving personal finance are incorporated to place the mathematics in real-world context.

2. **ECON 1101 {101} Principles of Microeconomics.** Every semester. The Economics Department.

An introduction to economic analysis and institutions, with special emphasis on the allocation of resources through markets. The theory of demand, supply, cost, and market structure is developed and then applied to problems in antitrust policy, environmental quality, energy, education, health, the role of the corporation in society, income distribution, and poverty. Students desiring a comprehensive introduction to economic reasoning should take both Economics 1101 {101} and 1102 {102}. For proper placement, students should fill out the economics placement request form and must be recommended for placement in Economics 1101. Not open to students who have taken Economics 1050.

3. **BIO 1102 {102} Biological Principles II.** Spring 2015. Amy Johnson.

The second in a two-semester introductory biology sequence. Emphasizes fundamental biological principles extending from the physiological to the ecosystem level of living organisms. Topics include physiology, ecology, and evolutionary biology, with a focus on developing quantitative skills as well as critical thinking and problem solving skills. Lecture and weekly laboratory/discussion groups.

4. **EARTH AND OCEAN SCIENCES 1305 {104} Environmental Geology and Hydrology.** Every spring. Spring 2015. Peter Lea.

An introduction to aspects of geology and hydrology that affect the environment and land use. Topics include lakes, watersheds and surface-water quality, groundwater contamination, coastal erosion, and/or landslides. Weekly labs and fieldwork examine local environmental problems affecting Maine's rivers, lakes, and coast. Students complete a community-based research project. (Same as Environmental Studies 1104 {104}.)

5. **ENV STUDIES 2004 {204} Understanding Place: GIS and Remote Sensing.** Every year. Spring 2015. Eileen Johnson.

Geographical information systems (GIS) organize and store spatial information for geographical presentation and analysis. They allow rapid development of high-quality maps and enable powerful and sophisticated investigation of spatial patterns and interrelationships. Introduces concepts of cartography, database management, remote sensing, and spatial analysis. The productive use of GIS and Remote Sensing technology with an emphasis on the biophysical sciences and environmental management is investigated through a variety of applied exercises and problems culminating in a semester project that addresses a specific environmental application.

6. **LATIN AMER STUDIES 2205 {205} Advanced Spanish.** Every semester. Fall 2014. Elena Cueto Asín, Margaret Boyle, and Enrique Yepes. Spring 2015. Nadia V. Celis and Carolyn Wolfenzon. Studies topics in the political and cultural history of the Spanish-speaking world in the twentieth century, together with an advanced grammar review. Covers a variety of texts and media and is designed to increase written and oral proficiency, as well as

appreciation of the intellectual and artistic traditions of Spain and Latin America.
Foundational course for the major.

7. **CHEM 2050 {205} Environmental Chemistry.** Spring 2015. Dharni Vasudevan.

Focuses on two key processes that influence human and wildlife exposure to potentially harmful substances—chemical speciation and transformation. Equilibrium principles as applied to acid-base, complexation, precipitation, and dissolution reactions are used to explore organic and inorganic compound speciation in natural and polluted waters; quantitative approaches are emphasized. Weekly laboratory sections are concerned with the detection and quantification of organic and inorganic compounds in air, water, and soils/sediments.

8. **BIO 2224 {215} Behavioral Ecology and Population Biology.** Every fall. Nathaniel T. Wheelwright.

Study of the behavior of animals and plants and the interactions between organisms and their environment. Topics include population growth and structure and the influence of competition, predation, and other factors on the behavior, abundance, and distribution of plants and animals. Laboratory sessions, field trips, and research projects emphasize concepts in ecology, evolution and behavior, research techniques, and the natural history of local plants and animals. Optional weekend field trip to Monhegan Island or the Bowdoin Scientific Station on Kent Island.

9. **BIO 2229 {219} Biology of Marine Organisms.** Every fall. Amy Johnson.

The study of the biology and ecology of marine mammals, seabirds, fish, intertidal and subtidal invertebrates, algae, and plankton. Also considers the biogeographic consequences of global and local ocean currents on the evolution and ecology of marine organisms. Laboratories, field trips, and research projects emphasize natural history, functional morphology, and ecology. Lectures and four hours of laboratory or field trip per week. One weekend field trip included.

10. **ENG 2352 {238} Natural Supernaturalism.** Spring 2015. David Collings.

Examines the Romantic attempt to blend aspects of the transcendental—such as the sublime, immortality, and divinity—with ordinary life, the forms of nature, and the resources of human consciousness. Discusses theories of the sublime, poetry of the English landscape, mountaintop experiences, tales of transfiguration, and evocations of intimacy with nature. Explores the difficulties of representing the transcendental in secular poetry and the consequences of natural supernaturalism for our own understanding of nature. Authors include Burke, Wordsworth, Coleridge, Kant, and Shelley.

11. **ENV. STUDIES 2431 {243} Modern Architecture: 1750 to 2000.** Fall 2015. Jill Pearlman.

Examines major buildings, architects, architectural theories, and debates during the modern period with a strong emphasis on Europe through 1900 and both the United States and Europe in the twentieth century. Central issues of concern include architecture as an important carrier of historical, social, and political meaning; changing ideas of history and progress in built form; and the varied architectural responses to industrialization. Attempts to develop students' visual acuity and ability to interpret architectural form while exploring these and other issues.

12. EARTH AND OCEAN SCIENCES 2525 {252} Marine Biogeochemistry. Spring 2015. Michèle LaVigne.

Oceanic cycles of carbon, oxygen, and nutrients play a key role in linking global climate change, marine primary productivity, and ocean acidification. Fundamental concepts of marine biogeochemistry used to assess potential consequences of future climate scenarios on chemical cycling in the ocean. Past climate transitions evaluated as potential analogs for future change, using select case studies of published paleoceanographic proxy records derived from corals, ice cores, and deep-sea sediments. Weekly laboratory sections and student research projects focus on creating and interpreting new geochemical paleoclimate records from marine archives and predicting future impacts of climate change and ocean acidification on marine calcifiers.

13. PHILOSOPHY 2448 {258} Environmental Ethics. Spring 2015. Lawrence H. Simon.

What things in nature have moral standing? What are our obligations to them? How should we resolve conflicts among our obligations? After an introduction to ethical theory, topics include anthropocentrism, the moral status of nonhuman sentient beings and of non-sentient living beings, preservation of endangered species and the wilderness, holism versus individualism, the land ethic, and deep ecology.

14. ENVIRONMENTAL STUDIES 3980 {337} Nature and Health in America. Spring 2015. Matthew Klinge.

Explores relationships between humans, environment, and health in North American history from the sixteenth century to the present day. Topics may include the evolution of public health, biomedical research, and clinical practice; folk remedies and popular understandings of health; infectious and chronic diseases; links between landscape, health, and inequality; gender and reproductive health; occupational health and safety; the effects of agriculture, industrialization, and urbanization on human and ecological health; state and federal policies; and the colonial and global dimensions of public health and medicine. Students write a major research paper based on primary sources. Environmental Studies 1101 {101}, 2403 {203}, and at least one history course numbered 2000–2969 {200–289} recommended.

- 15. GOV & LEGAL STUDIES 3963 {363} Advanced Seminar in International Relations: Law, Politics, and the Search for Justice.** Spring 2015. Allen L. Springer.

Examines the complex relationship between law and policy in international relations by focusing on two important and rapidly developing areas of international concern: environmental protection and humanitarian rights. Fulfills the environmental studies senior seminar requirement.
- 16. ENV STUDIES 3991 {391} Troubled Waters: Fishing in the Gulf of Maine.** Spring 2015. The Program.

Around the world and in the Gulf of Maine, overfishing, threats to habitat, and climate change are putting marine ecosystems and coastal communities under great stress. An interdisciplinary senior seminar draws on oceanography, ecology, history, economics, anthropology, and political science to explore the causes and scope of pressures on the marine environment; the potential for restoring ecosystems, fisheries, and coastal economies; political conflicts over fisheries and related issues; federal, state, and community-based approaches to managing marine ecosystems; and strategies for coping with scientific and management uncertainties.
- 17. ENV STUDIES 3998 {398} The City since 1960.** Fall 2014. Jill Pearlman.

Seminar. Focuses on five important developments in the history of the American city (with a brief excursion to London) during the past half-century. Themes include: urban renewal's rise and fall, historic preservation, gentrification, urban disasters and their aftermaths, and the changing notion of community. Examines these issues in some depth through primary and secondary source readings and, at the end of the course, considers the city today. Throughout the semester, students pursue a research project of their own, culminating in a presentation to the class and a substantial (twenty-five-page) paper.
- 18. MATH 2108 {204} Biomathematics.** Fall 2014. Mary Lou Zeeman.

A study of mathematical modeling in biology, with a focus on translating back and forth between biological questions and their mathematical representation. Biological questions are drawn from a broad range of topics, including disease, ecology, genetics, population dynamics, and neurobiology. Mathematical methods include discrete and continuous (ODE) models and simulation, box models, linearization, stability analysis, attractors, oscillations, limiting behavior, feedback, and multiple time-scales. Three hours of class meetings and 1.5 hours of computer laboratory sessions per week. Within the biology major, this course may count as the mathematics credit or as biology credit, but not both. Students are expected to have taken a year of high school or college biology prior to this course.
- 19. ENGLISH 3017 {346} Living Deliberately.** Fall 2014. David Collings.

Explores a range of possibilities for taking up Thoreau's challenge to "live deliberately," for cultivating an ethics in a world without guarantees. Examines various projects for grasping the essential conditions of existence, overcoming ignorance and despair, assuming an infinite responsibility to others, and sustaining the human against impossible odds. Considers the place of such projects in relation to the negative ethics of crime or addiction, the dubious implications of ethical heroism, the intimate risks of political commitment, and the potential loss of a viable future in the era of climate change. Drawing on novels, memoirs, ecological writing, theories of sexual practice, and philosophical ethics, considers such authors as Thoreau, Forster, Genet, Gordimer, Sapphire, Anita Desai, Kidder, and McKibben, as well as Nietzsche, Levinas, Foucault, Derrida, Halperin, Zizek, and Soni

20. EARTH AND OCEAN SCIENCE 3140 {343} Tectonics and Climate. Spring 2015. Emily Peterman.

Exploration of the complex interactions between tectonics and climate. Discussion of current research is emphasized by reading primary literature, through class discussions and presentations, and by writing scientific essays. The emphasis on current research means topics may vary, but include: the rise of continents, the evolution of plate tectonics on Earth over the last 4.5 billion years, ancient mountain belts, supercontinents, the record of earth system processes preserved in the geologic record, predictions of how the modern earth system will be recorded in the future rock record, the topographic growth of mountain belts, and Cenozoic climate change. (Same as Environmental Studies 3943{343}.)

21. BIOLOGY 2325 {225} Biodiversity and Conservation Science. Fall 2015. John Lichter.

People rely on nature for food, materials, medicines, and recreation; yet the fate of Earth's biodiversity is rarely given priority among the many pressing problems facing humanity today. Explores the interactions within and among populations of plants, animals, and microorganisms and the mechanisms by which those interactions are regulated by the physical and chemical environment. Major themes are biodiversity and the processes that maintain biodiversity, the relationship between biodiversity and ecosystem function, and the science underlying conservation efforts. Laboratory sessions consist of student research, local field trips, laboratory exercises, and discussions of current and classic ecological literature.

22. EARTH AND OCEAN SCIENCE 1105 {101} Investigating Earth. Every fall. Fall 2014. Emily Peterman.

Dynamic processes, such as earthquakes, sea-floor spreading, subduction and volcanoes, shape the earth on which we live. Explores these processes and the rocks and minerals they produce from the framework of plate tectonics during class and laboratory sections. Weekly field laboratories investigate rocks exposed along the Maine coast. Students complete a research project on Maine geology

23. EARTH AND OCEAN SCIENCE 2005 {200} Biogeochemistry: An Analysis of Global Change. Every fall. Philip Camill.

Understanding global change requires knowing how the biosphere, geosphere, oceans, ice, and atmosphere interact. An introduction to earth system science, emphasizing the critical interplay between the physical and living worlds. Key processes include energy flow and material cycles, soil development, primary production and decomposition, microbial ecology and nutrient transformations, and the evolution of life on geochemical cycles in deep time. Terrestrial, wetland, lake, river, estuary, and marine systems are analyzed comparatively. Applied issues are emphasized as case studies, including energy efficiency of food production, acid rain impacts on forests and aquatic systems, forest clearcutting, wetland delineation, eutrophication of coastal estuaries, ocean fertilization, and global carbon sinks. Lectures and three hours of laboratory or fieldwork per week.

24. EARTH AND OCEAN SCIENCE 3020 {302} Earth Climate History. Spring 2015. Philip Camill.

The modern world is experiencing rapid climate warming and some parts extreme drought, which will have dramatic impacts on ecosystems and human societies. How do contemporary warming and aridity compare to past changes in climate over the last billion years? Are modern changes human-caused or part of the natural variability in the climate system? What effects did past changes have on global ecosystems and human societies? Students use environmental records from rocks, soils, ocean cores, ice cores, lake cores, fossil plants, and tree rings to assemble proxies of past changes in climate, atmospheric CO₂, and disturbance to examine several issues: long-term carbon cycling and climate, major extinction events, the rise of C₄ photosynthesis and the evolution of grazing mammals, orbital forcing and glacial cycles, glacial refugia and post-glacial species migrations, climate change and the rise and collapse of human civilizations, climate/overkill hypothesis of Pleistocene megafauna, climate variability, drought cycles, climate change impacts on disturbances (fire and hurricanes), and determining natural variability vs. human-caused climate change.

25. BIO 2271 {271} Biology of Marine Mammals. Fall 2014. Damon P. Gannon.

Examines the biology of cetaceans, pinnipeds, sirenians, and sea otters. Topics include diversity, evolution, morphology, physiology, ecology, behavior, and conservation. Detailed consideration given to the adaptations that allow these mammals to live in the sea. Includes lecture, discussion of primary literature, lab, field trips, and student-selected case studies. Laboratory and field exercises consider anatomy, biogeography, social organization, foraging ecology, population dynamics, bioacoustics, and management of the marine mammal species 150 found in the Gulf of Maine.

26. **HISTORY / ES 2416 {250} California Dreamin': A History of the Golden State.** Spring 2015. Connie Chiang.

Seminar. Sunshine, beaches, shopping malls, and movie stars are the popular stereotypes of California, but social conflicts and environmental degradation have long tarnished the state's golden image. Unravels the myth of the California dream by examining the state's social and environmental history from the end of Mexican rule and the discovery of gold in 1848 to the twenty-first century. Major topics include immigration and racial violence; radical and conservative politics; extractive and high-tech industries; environmental disasters; urban, suburban, and rural divides; and California in American popular culture.

27. **CHEMISTRY 2520 {252} Quantum Chemistry and Spectroscopy.** Every spring. Soren N. Eustis.

Development and principles of quantum chemistry with applications to atomic structure, chemical bonding, chemical reactivity, and molecular spectroscopy. Lectures and four hours of laboratory work per week. Mathematics 1800 {181} is recommended. Includes the fundamental equations controlling how light and matter interact. Covers relevant phenomena, including: Blackbody radiation and global warming; Photovoltaic technology; Sunlight driven chemical transformations in the environment.

28. **FILM STUDIES 1043 {23} East Asian Genre Cinema: Action, Anime, and Martial Arts.** Fall 2014. Shu-chin Tsui.

Explores East Asian cinema from a genre perspective with a focus on Hong Kong action, Japanese anime, and transnational martial arts films. In the framework of social-cultural history and context of genre theory, examines the paradigms that characterize the form and content of such films; investigates the relations between local-global and national-transnational; studies genre-specific issues such as spectators' perception or industry practices to discern the role of gender, nation, power, and historiography. Students learn theoretical concepts of genre cinema, analyze the genre's visual formation, and comprehend the social-cultural implications of the genre. *Note:* Fulfills the non-US cinema requirement for cinema studies minors.

29. **ENV STUDIES 1004 A Global History of Food.** Fall 2014. Thomas Fleischman.

Examines the shifting relationship between people, food, and the environment that ties them together. How have distance and space between the sites of production and consumption affected the economic and social relations of food? How has geography influenced the types of food people eat? How do views of scarcity and plenty shape approaches to farming? What is the role of governments and markets in agriculture? How does food refract and transform social divisions, cultural attitudes, and daily life? Topics

include rural development; subsistence gardening; famine; histories of sugar, corn, pork, fish, whales, ice cream, and anything else that fits on a plate.

30. **EARTH AND OCEAN SCIENCE 2540 a - INS. Equatorial Oceanography.** Spring 2015. Michèle LaVigne.

The equatorial ocean is a region with virtually no seasonal variability, yet it undergoes the strongest interannual to decadal climate variations of any oceanographic province. This key region constitutes one of the most important yet highly variable natural sources of carbon dioxide (CO₂) to the atmosphere. Explores how circulation, upwelling, biological activity, biogeochemistry, and CO₂ flux in this key region vary in response to rapid changes in climate. Particular emphasis on past, present, and future dynamics of the El Niño Southern Oscillation. In-class discussions are focused on the primary scientific literature.

31. **GOV 2570 {220} The Politics of Development: Poverty, Prosperity, and Political Change.** Fall 2014. Ericka A. Albaugh.

Examines the meaning of development from economic and political perspectives. Considers various theories and practices of development that have been applied to newly independent states in Asia, Latin America, and Africa. Investigates why trajectories of economic growth and political stability have been so uneven in different regions of the world. Incorporates views from both external and internal actors on issues such as foreign aid, multilateral institutions, good governance, and democratic participation.

32. **ECON 3350 {370} Mathematical Economics.** Spring 2015. Erik Nelson.

A survey of some of the mathematical techniques used to conduct economic analyses. Topics include utility maximization under uncertainty; solving constrained optimization problems with mathematical programming; optimal control theory; solving complex equations and systems of equations with numerical methods; dynamic programming; and general equilibrium analysis. Students learn to solve problems with MATLAB and other similar programming and statistical software.

33. **PHYSICS 1083 Energy, Physics, and Technology.** Fall 2014. Mark Battle and Madeleine Msall.

How much can we do to reduce the disruptions of the Earth's physical, ecological, and social systems caused by global climate change? How much climate change itself can we avoid? A lot depends on the physical processes that govern the extraction, transmission, storage, and use of available energy. Introduces the physics of solar, wind, nuclear, and hydroelectric power and discusses the physical constraints on their efficiency, productivity, and safety. Reviews current technology and quantitatively analyzes the effectiveness of different strategies to reduce greenhouse gas emissions.

34. **ENGLISH / ENV STUDIES 2854 {213} Telling Environmental Stories.** Fall 2014. Anthony Walton.

Intended for students with a demonstrated interest in environmental studies, as an introduction to several modes of storytelling, which communicate ideas, historical narratives, personal experiences, and scientific and social issues in this increasingly important area of study and concern. Explores various techniques, challenges, and pleasures of storytelling, and examines some of the demands and responsibilities involved in the conveyance of different types of information with clarity and accuracy in nonfiction narrative. Engages student writing through the workshop method and incorporates study of several texts, including *The Control of Nature*, *Cadillac Desert*, *Living Downstream*, and *Field Notes from a Catastrophe*. (Same as Environmental Studies 2423 {216}.)