

Environmental Studies

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Program of Study

In the early twenty-first century, environmental challenges—including deforestation, climate change, pollution, water resources, habitat loss, and the food and energy needs of a growing population—are among the most pressing issues facing the world. Many environmental processes operate at a global scale and create natural and human consequences that cannot be addressed solely from within a single area or discipline. At the same time, local and historical conditions are always at issue in addressing environmental processes, problems, and possibilities. The study of critical environmental issues requires both area specific knowledge and knowledge that crosses traditional academic and geographic boundaries. The Environmental Studies program allows students to address these issues through focused interdisciplinary coursework and research.

The undergraduate major emphasizes interdisciplinary approaches to environmental topics, incorporating models and methods from the humanities and social and natural sciences.

Students who are majoring in Environmental Studies are expected to build a foundation for studying environmental questions by completing basic course work both in the natural sciences and in quantitative analyses. The program draws on the existing strengths and interests of College faculty in a variety of disciplines and divisions. The curriculum is organized around required elements that include (1) a common introductory sequence; (2) course work in two broadly conceived thematic tracks; (3) a thesis; and (4) an internship or field studies component.

The two thematic tracks are (1) environmental economics and policy, and (2) socio-natural systems and frameworks. Although students will design a program of study that will emphasize one of the tracks, course work from each will be included.

The major in Environmental Studies is coordinated by the Program on the Global Environment, which is housed in the Center for International Studies (P 101).

Students in other fields of study may also complete a minor in Environmental Studies. Information follows the description of the major.

NOTE: The BS in Environmental Science that is offered by the Department of Geophysical Sciences may be more appropriate for students who intend to pursue

postgraduate studies or professional careers in the natural sciences. Students who matriculated before July 2006 and have questions about Environmental Studies courses that they have already taken should contact the program director of Environmental Studies, Mark Lycett (702.6040, mlycett@uchicago.edu), to devise their program of study.

Summary of Program

Students who are majoring in Environmental Studies must take thirteen courses according to the following guidelines.

- I. **Environmental Studies Core Sequence.** Students are required to take the two-course core sequence in Environmental Studies (ENST 21201-21301). Courses may be taken in any order. One course provides an overview of fundamental issues in environmental studies while the other stresses contemporary concerns and policy applications. Each course is oriented toward one of the basic thematic tracks. Students are strongly encouraged to complete the sequence in their second year.
- II. **Thematic Tracks.** Students must take four courses in their area of emphasis and two courses in their supporting track for a total of six courses.
 - A. *Environmental Economics and Policy Track:* This concentration emphasizes issues such as environmental law, development, globalization, and policy studies. This track has a more applied focus and is inclined more toward present-day issues and strategies in the context of politics, law, and economics.
 - B. *Socio-natural Systems and Frameworks Track:* This concentration emphasizes environmental history; landscape studies; human ecology and demography; and environmental ethics, philosophy, and representation. Included in this track are courses on cultural and historical constructions of the natural and the human; this track emphasizes intellectual frameworks as well as the use of substantive information from the social sciences, sciences, and humanities.
- III. **Quantitative Analysis.** One course must be taken to demonstrate competence in quantitative analysis. Students may choose to take either STAT 22000 or an equivalent.
- IV. **Environmental Sciences.** Students must take three courses in environmental sciences. This supporting course work must be chosen from an approved list.
- V. **BA Thesis.** Students are required to take one course that emphasizes research design and skills and the writing process. Students are expected to develop significant independent research projects in close consultation with their preceptor and faculty adviser. In consultation with Environmental Studies

preceptors, students prepare a topic page that is due eighth week of Spring Quarter in their third year.

At this time, students are also required to secure a faculty adviser. The thesis adviser may be chosen from among the faculty teaching in Environmental Studies and related fields. The preceptor serves as a second reader on all theses. Where appropriate, outside scholars, scientists, or policy experts may be added as additional readers with the approval of the program director.

In Autumn Quarter of their fourth year, students register for BA Colloquium I (ENST 29801), which is designed to teach research skills and more generally to aid the research and writing process. The final version of the BA thesis is due by the second Friday of the quarter in which the student plans to graduate.

This program may accept a BA paper or project used to satisfy the same requirement in another major if certain conditions are met and with the consent of the other program director. Approval from both program directors is required. Students should consult with the directors by the earliest BA proposal deadline (or by the end of their third year, when neither program publishes a deadline). A consent form, to be signed by the directors, is available from the College adviser. It must be completed and returned to the College adviser by the end of Autumn Quarter of the student's year of graduation.

VI. Internship or field studies program. In addition to course work, students will be required to participate in an approved internship or field studies program with significant links to their program of study.

Summary of Requirements

2	Environmental Studies core sequence (ENST 21201-21301)
4	courses in the thematic track of emphasis
2	courses in the supporting thematic track
1	STAT 22000 or equivalent
3	courses in the environmental sciences chosen from an approved list
1	BA Colloquium I (ENST 29801)
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Advising. Application for admission to the Environmental Studies program should be made to the program adviser, who explains requirements and arranges a preliminary program of study. Admission to the major or minor is complete when a program of study has been approved by the program director. This program of study, which the student formulates in consultation with both the program adviser and the program director, should be in place by a student's third year.

Grading. Students who are majoring in Environmental Studies must receive quality grades in all thirteen courses taken to meet the requirements of the program. Students may apply a maximum of two course credits for supervised individual reading or research to meet the requirements of the program.

Honors. Eligibility for honors requires an overall GPA of 3.0 or higher, a GPA of 3.5 or higher in the courses taken to meet the requirements of the program, and a BA thesis that is judged to be superior by the faculty and preceptor readers.

Minor Program in Environmental Studies

Students who are not Environmental Studies majors may complete a minor in Environmental Studies. Such a minor requires that six courses be taken according to the following guidelines: Human Impact on the Environment (ENST 21201), Making the Natural World: Foundations of Human Ecology (ENST 21301), and four courses in one of the two thematic tracks chosen in consultation with the program director.

Students who elect the minor program in Environmental Studies should meet with the program director before the end of Spring Quarter of their third year to declare their intention to complete the minor and select appropriate courses. The approval of the program director for the minor program should be submitted to a student's College adviser by the deadline above on a form obtained from the adviser.

Courses in the minor (1) may not be double counted with the student's major(s) or with other minors and (2) may not be counted toward general education requirements. Courses in the minor must be taken for quality grades, and at least half of the requirements for the minor must be met by registering for courses bearing University of Chicago course numbers.

Summary of Requirements for the minor program:

1	ENST 21201
1	ENST 21301
$\frac{4}{6}$	courses in one of the two thematic tracks

Faculty

F. Albritton Jonsson, D. Archer, J. Borevitz, T. Nichols Clark, D. Coursey, P. R. Crane, L. Grenoble, A. Gugliotta, A. Kolata, M. LaBarbera, J. List, M. T. Lycett, P. Martin, K. D. Morrison, W. Schweiker, S. Shaikh, L. J. Waite

Courses: Environmental Studies (ENST)

I. Required Introductory Sequence

ENST 21201 and 21301 are required of students who are majoring in Environmental Studies and may be taken in any order.

21201. Human Impact on the Environment. (=NCDV 21201) The goal of this course is to analyze the impact of the human enterprise on the world that sustains it. Topics include human population dynamics, historical trends in human well-being, and our use of natural resources—especially in relation to the provision of energy, water, and food—and the impacts that these activities have on the range of goods and services provided by geological/ecological systems. We read and discuss diverse sources and write short weekly papers. *P. Crane. Autumn.*

21301. Making the Natural World: Foundations of Human Ecology. (=ANTH 21303) This course considers the conceptual underpinnings of contemporary Western notions of ecology, environment, and balance, but it also examines several specific historical trajectories of anthropogenic landscape change. We approach these issues from the vantage of several different disciplinary traditions, including environmental history, philosophy, ecological anthropology, and paleoecology. *M. Lycett. Winter.*

II. General Courses

11101-11200-11301. General Chemistry I, II, III (Variant A). (=CHEM 11101-11201-11301) *PQ: Good performance on the mathematics or calculus placement test. The first two courses in this sequence meet the general education requirement in the physical sciences.* Variants A and B are equivalent in the first and second quarters but differ in focus in the third quarter as detailed below. Both three-quarter sequences cover atomic and molecular theories, chemical periodicity, chemical reactivity and bonding, chemical equilibria, acid-base equilibria, solubility equilibria, phase equilibria, thermodynamics, electrochemistry, kinetics, and nuclear chemistry. Examples are drawn from chemical, biological, and material systems. The laboratory portion includes an introduction to quantitative measurements, investigation of the properties of the important elements and their compounds, and experiments associated with the common ions and their separation and identification.

11101-11201-11301. General Chemistry I, II, III (Variant A). (=CHEM 11101-11201-11301) *PQ: Good performance on the mathematics or calculus placement test. The first two courses in this sequence meet the general education requirement in the physical sciences.* Variant A is presented at the same level as Variant B, but the material in the third quarter is presented from a more synthetic perspective. *Autumn, Winter, Spring. L: M. Zhao, S. Sibener, Autumn; A. Dinner, Winter; S. Kozmin, Spring.*

11102-11202-11302. General Chemistry I, II, III (Variant B). *PQ: Good performance on the mathematics or calculus placement test. The first two courses in*

this sequence meet the general education requirement in the physical sciences. Variant B is presented at the same level as Variant A, but the material in the third quarter is presented from a more physical perspective. *Autumn, Winter, Spring. L: M. Zhao, K. Y. C. Lee, Autumn; K. Freed, Winter; M. Mrksich, Spring.*

12100. Chemistry and the Atmosphere. (=PHSC 13500) *PQ: MATH 10600, or placement in MATH 13100 or higher.* This course focuses on aspects of chemistry as they apply to the Earth's atmosphere. The first half considers atmospheric structure and fundamental chemical principles, while the second half presents examples of chemical systems that operate in the atmosphere. Topics include the chemical composition of the atmosphere, the structure of atoms and molecules, the nature of chemical reactions, the interaction of solar radiation with atmospheric gases, the properties of the water molecule, formation of an ozone layer, and the chemistry of urban air pollution. *J. Frederick. Autumn. L.*

12300. Global Warming: Understanding the Forecast. (=GEOS 13400, PHSC 13400) *PQ: MATH 10600, or placement into 13100 or higher, or consent of instructor required; some knowledge of chemistry or physics helpful.* This course presents the science behind the forecast of global warming to enable the student to evaluate the likelihood and potential severity of anthropogenic climate change in the coming centuries. It includes an overview of the physics of the greenhouse effect, including comparisons with Venus and Mars; an overview of the carbon cycle in its role as a global thermostat; predictions and reliability of climate model forecasts of the greenhouse world; and an examination of the records of recent and past climates, such as the glacial world and Eocene and Oligocene warm periods. *D. Archer. Autumn, Spring. L.*

12404. Environmental Ecology. (=BIOS 13107, NTSC 10400) *PQ: BIOS 10110 or BIOS 10130.* This course emphasizes basic scientific understanding of ecological principles that relate most closely to the ways humans interact with their environments. It includes lectures on the main environmental pressures, notably human population growth, disease, pollution, climate change, habitat destruction, and harvesting. We emphasize the ongoing impacts on the natural world, particularly causes of population regulation and extinction and how they might feed back on to humans. *T. Price. Spring.*

13106. The Hungry Earth: Light, Energy, and Subsistence. (=BIOS 13106) *PQ: BIOS 10110 or BIOS 10130.* This course considers the continuing erosion of the resources of the Earth by the persisting pressures of a growing human population, which makes a broad knowledge and appreciation of biology essential. Discussion includes the principles of energy conversion by plants as primary producers, the evolution of the structures and mechanisms involved in energy conversion, the origin of crop plants, improvements of plants by conventional breeding and genetic engineering, and the interactions of plants with pathogens and herbivores. *M. Ruddat. Winter.*

13113-27100-27200-27300. Calumet Quarter. *PQ: Enrollment is based on acceptance into Calumet Quarter Program. Visit pge.uchicago.edu/calumet for an*

application, which requires an unofficial transcript and letter of recommendation. ENST 13113-27100-27200-27300 must be taken concurrently. This full-time, one-quarter sequence is intended to help students bridge theory and practice in environmental studies. The program features four integrated courses, projects, field trips, guest lectures, and presentations. Students work in the classroom, lab, and field as they integrate perspectives from the sciences, humanities, and social sciences in the study of local environments and communities.

13113. Prairie Ecosystems: Lessons of Sustainability in the Past, Present, and Future. *PQ: BIOS 10110 or 10130. Third- or fourth-year standing or consent of instructor. Warm coat and ability to walk five miles required.* This course looks at the Midwest prairie as a model ecosystem. How and when did grasslands evolve? And where and when did they become established? How many species and biotrophic levels are interconnected in a regularly disturbed environment? Are there keystone species? What are the ecological forces that maintain, destroy, and restore balance? Glacial retreat, fire, deep-rooted perennial grasses, large herbivores, deforestation, industrial agriculture, and biofuels are covered. We then apply what we have we learned from the grasslands to live sustainably. *J. Borevitz. Spring.*

27100. Integrative Research Seminar: Calumet. This course examines the history of land use and social and environmental issues in the Calumet region. In addition to discussing the Calumet region broadly, students develop final projects grounded in research from all courses in the field studies program. Talks and discussions are led each week by guest lecturers who represent industry, nonprofit organizations, or Chicago government, or who are conducting research within the Calumet region. *M. McLeester. Spring.*

27200. The Calumet Experience. This course is the field component of the Calumet Quarter. Throughout the quarter, students visit restoration sites, historical landmarks, industrial zones, and conservation zones throughout the Calumet region. In addition to day-long field trips, students are expected to attend weekly lunch sessions (lunch is provided) with professionals through the Calumet region and the Calumet Research Summit in April. *R. Keller. Spring.*

27300. Freshwater Ecosystems of the Calumet Region. The Calumet region contains a wide range of important freshwater ecosystems. The Great Lakes are possibly the world's most valuable freshwater ecosystem, while the Kankakee marshes previously supported a massive diversity and abundance of waterfowl and other native species. Since European colonization most of the marshes of the Calumet region have been drained for agriculture, urbanization, or to create new land for industry. All remaining freshwater ecosystems in the Calumet region, including Lake Michigan, have been affected by invasive species, chemical pollution, overfishing, and numerous other factors. This course examines the history of impacts on the extent and functioning of freshwater ecosystems in the Calumet region. Particular attention is paid to the pre-European state of Calumet freshwaters, the impacts of land-use

change and invasive species, and the prospects for restoration. The entire course is framed within the context of the economic conditions that allowed freshwater habitats in the Calumet region to be so strongly modified and how current economic conditions affect the likely future of these ecosystems. *R. Keller. Spring.*

13300. The Atmosphere. (=GEOS 13300) *PQ: MATH 13200 or consent of instructor.* This course introduces the physics, chemistry, and phenomenology of the Earth's atmosphere, with an emphasis on the role of the atmosphere as a component of the planet's life support system. Topics include (1) atmospheric composition, evolution, and structure; (2) solar and terrestrial radiation; (3) the role of water in atmospheric processes; (4) winds, the global circulation, and weather systems; and (5) atmospheric chemistry and pollution. We focus on the mechanisms by which human activity can influence the atmosphere and on interactions between atmosphere and biosphere. *J. Frederick. Spring.*

20500. Introduction to Population. (=SOCI 20122/30122) This course introduces the field of demography, which examines the growth and characteristics of human populations. It also provides an overview of our knowledge of three fundamental population processes: fertility, mortality, and migration. We cover marriage, cohabitation, marital disruption, aging, and population and environment. In each case we examine historical trends. We also discuss causes and consequences of recent trends in population growth, as well as the current demographic situation in developing and developed countries. *L. Waite. Winter.*

21800. Economics and Environmental Policy. (=LLSO 26201, PBPL 21800) *PQ: ECON 19800 or higher, or PBPL 20000.* This course combines basic microeconomic theory and tools with contemporary environmental and resources issues and controversies to examine and analyze public policy decisions. Theoretical points include externalities, public goods, common-property resources, valuing resources, benefit/cost analysis, and risk assessment. Topics include pollution, global climate change, energy use and conservation, recycling and waste management, endangered species and biodiversity, nonrenewable resources, congestion, economic growth and the environment, and equity impacts of public policies. *S. Shaikh. Autumn.*

22000. The Anthropology of Development. (=ANTH 22000/35500) This course applies anthropological understanding to development programs in "underdeveloped" and "developing" societies. Topics include the history of development; different perspectives on development within the world system; the role of principal development agencies and their use of anthropological knowledge; the problems of ethnographic field inquiry in the context of development programs; the social organization and politics of underdevelopment; the culture construction of "well-being"; economic, social, and political critiques of development; population, consumption, and the environment; and the future of development. *A. Kolata. Not offered 2009–10; will be offered 2010–11.*

ENST 22504. Losing the Farm: Globalization and Food Production in the 20th Century. (= HIST 17104) Who grows the food you eat? How do they grow it? Where do they grow it? And how is it that you can buy fresh fruit in the dead of winter? This course aims to answer these questions through an examination of the development of industrial agriculture in the 20th century. We pay particular attention to how the development of industrial agricultural emerged in the 20th century as a global phenomenon—from the import and export of new and exotic foods to the global food crisis of the 1970s. Lastly, we will examine critiques of industrial and global agriculture, from the new agrarians to the rising popularity of the local foods movement. One Saturday field trip required. *V. Bivar. Autumn.*

23100. Environmental Law. (=HIPS 28801, LLSO 23100, PBPL 23100) *PQ: Third- or fourth-year standing, or consent of instructor.* This lecture/discussion course examines the development of laws and legal institutions that address environmental problems and advance environmental policies. Topics include the common law background to traditional environmental regulation, the explosive growth and impact of federal environmental laws in the second half of the twentieth century, regulations and the urban environment, and the evolution of local and national legal structures in response to environmental challenges. *Autumn.*

23289. Marine Ecology. (=BIOS 23289) *PQ: Prior introductory course in ecology or consent of instructor.* This course provides an introduction into the physical, chemical, and biological forces controlling the function of marine ecosystems and how marine communities are organized. The structures of various types of marine ecosystems are described and contrasted, and the lectures highlight aspects of marine ecology relevant to applied issues such as conservation and harvesting. *T. Wootton. Winter.*

23500. Political Sociology. (=PBPL 23600, SOCI 20106/30106) *PQ: Completion of the general education requirement in social sciences.* This course provides analytical perspectives on citizen preference theory, public choice, group theory, bureaucrats and state-centered theory, coalition theory, elite theories, and political culture. These competing analytical perspectives are assessed in considering middle-range theories and empirical studies on central themes of political sociology. Local, national, and cross-national analyses are explored. *T. Clark. Spring.*

23600. The Environment in U.S. History. (=HIST 19000, LLSO 23600) This course examines human engagement with the natural world in what is now the United States. The promise of Edenic bounty, the threat of desolate wilderness, and the temptations of unprecedented affluence have each been seen as crucial to the formation of American identity. We explore the interaction of environmental change with human activities and ideologies that reflect broader themes in American culture. *A. Gugliotta. Winter. Not offered 2009–10; will be offered 2010–11.*

23900. Environmental Chemistry. (=GEOS 23900) *PQ: CHEM 11101-11201 or equivalent, and prior calculus course.* The focus of this course is the fundamental science underlying issues of local and regional scale pollution. In particular, the lifetimes of important pollutants in the air, water, and soils are examined by considering the roles played by photochemistry, surface chemistry, biological processes, and dispersal into the surrounding environment. Specific topics include urban air quality, water quality, long-lived organic toxins, heavy metals, and indoor air pollution. Control measures are also considered. *This course is offered in alternate years. D. Archer, A. Colman. Autumn. L.*

24400. Is Development Sustainable? (=BPRO 23400, HIPS 23400, NCDV 27300, PBPL 24400) *PQ: Third- or fourth-year standing required; background in environmental issues not required.* This discussion course grapples with the “big problem” of sustainable development. We analyze problematical issues underlying population growth, resource use, environmental transformation, and the plight of developing nations through a consideration of economic, political, scientific, and cultural institutions and processes. *Y. Fujita, G. Davis. Spring.*

24701. U.S. Environmental Policy. (=LLSO 24901, PBPL 24701) Making environmental policy is a diverse and complex process. Environmental advocacy engages different governmental agencies, congressional committees, and courts, depending on the issue. This course examines how such differentiation has affected policy making over the last several decades. *R. Lodato. Winter.*

24705. Energy: Science, Technology, and Human Usage. (=GEOS 24705) *PQ: Knowledge of physics or consent of instructor.* This course covers the technologies by which humans appropriate energy for industrial and societal use, from steam turbines to internal combustion engines to photovoltaics. We also discuss the physics and economics of the resulting human energy system: fuel sources and relationship to energy flows in the Earth system; and modeling and simulation of energy production and use. Our goal is to provide a technical foundation for students interested in careers in the energy industry or in energy policy. Field trips to major energy converters (e.g., coal-fired and nuclear power plants, oil refinery, biogas digester) and users (e.g., steel, fertilizer production) required. *E. Moyer. Winter.*

25100. Ecological Applications to Conservation Biology. (=BIOS 23351, ECEV 31300) *PQ: Completion of the general education requirement for the biological sciences and consent of instructor.* This course focuses on the contribution of ecological theory to the understanding of current issues in conservation biology. We emphasize quantitative methods and their use for applied problems in ecology (e.g., design of natural reserves, risk of extinction, impact of harvesting, dynamics of species invasions, role of species interaction). Course material is drawn mostly from the current primary literature. One Saturday field trip and computer modeling labs required in addition to scheduled class time. *C. Pfister, E. Larsen. Autumn. L.*

25300. The Planetary Footprint of Farming. (=GEOS 25300) *PQ: Third- or fourth-year standing, or consent of instructor.* This course draws on a ten-day field study of small, organic farms in the Berkshires to explore the environmental impact of modern industrial agriculture and realistic alternatives. Of interest are the roles of natural setting (i.e., geology, climate, meteorology); energy use and material flow; techniques of food production; dietary choices; and development and conservation strategies. Students are financially responsible for travel in December. A classroom component of lectures, readings, and exercises precedes the field trip. *P. Martin. Autumn, Winter.*

25500. Biogeography. (=BIOS 23406, EVOL 45500) *PQ: Completion of the general education requirement for the biological sciences and a course in either ecology, evolution, or earth history; or consent of instructor.* This course examines factors governing the distribution and abundance of animals and plants. Topics include patterns and processes in historical biogeography, island biogeography, geographical ecology, areography, and conservation biology (e.g., design and effectiveness of nature reserves). *B. Patterson (odd years, lab); L. Heaney (even years, discussion). Winter.*

ENST 25701-25702-25703. Feeding the City: The Urban Food Chain. (=GEOS 24711-24712-24714) *PQ: Consent of instructor based on application. Enrollment preference given to second- and third-year students. GEOS 24713 is a zero-unit, noncredit course that must be taken for P/F grading. This sequence meets the field study/intern degree requirement for students who are majoring in Environmental Studies.* For course description, see Geophysical Sciences. *Two-quarters of credit (200 units) are granted in the final quarter after successful completion of all three quarters and the summer internship. To meet requirements for full-time student status, students must carry at least three additional courses while registered for this course. Stipend provided for summer internship. P. Martin. Winter, Spring, Autumn.*

25900. Cultural Geography. (=GEOG 20100/30100) This course is an examination of the two main concerns of this field of geography: (1) the logic and pathology revealed in the record of the human use and misuse of the Earth, and (2) the discordant relationship of the world political map with more complicated patterns of linguistic and religious distribution. *M. Mikesell. Winter.*

26100. Roots of the Modern American City. (=GEOG 26100/36100, HIST 28900/38900) This course traces the economic, social, and physical development of the city in North America from pre-European times to the mid-twentieth century. We emphasize evolving regional urban systems, the changing spatial organization of people and land use in urban areas, and the developing distinctiveness of American urban landscapes. All-day Illinois field trip required. *This course is offered in alternate years. M. Conzen. Autumn.*

26400. Political Economy of Natural Resources in Southeast Asia. This course reviews historical development of resource use and management in Southeast Asia. In particular, we examine development of institutions and discourses that define and regulate the use and management of natural resources in Southeast Asia and

discuss prevailing environmental issues in Southeast Asia. We also examine how state and non-state actors develop and define who has control over and access to resources and the process of territorializing natural resources. *Y. Fujita. Autumn.*

26500. Environmental Economics. (=ECON 26500, PPHA 32800) *PQ: ECON 20100.* This course applies theoretical and empirical economic tools to environmental issues. We discuss broad concepts such as externalities, public goods, property rights, market failure, and social cost-benefit analysis. These concepts are applied to areas that include nonrenewable resources, air and water pollution, solid waste management, and hazardous substances. We emphasize analyzing the optimal role for public policy. *G. Tolley, S. Shaikh. Winter.*

26510. Advanced Topics in Environmental Economics. (=ECON 26510) *PQ: ECON 20900, 21000, or 26500; or ENST 26500.* This course applies theoretical and empirical economic tools to a number of environmental issues. We discuss broad concepts that include externalities, public goods, property rights, market failure, and benefit-cost analysis. These concepts are applied to a number of areas that include nonrenewable resources, air and water pollution, solid waste management, and hazardous substances. We emphasize analyzing the optimal role for public policy. *J. List. Spring.*

27400. Principles of Epidemiology. (=HSTD 30900, PPHA 36400, STAT 35000) *Introductory statistics recommended.* Epidemiology is the study of the distribution and determinants of health and disease in human populations. This course introduces the basic principles of epidemiologic study design, analysis, and interpretation, through lectures, assignments, and critical appraisal of both classic and contemporary research articles. The course objectives include: (1) to be able to critically read and understand epidemiologic studies; (2) to be able to calculate and interpret measures of disease occurrence and measures of disease-exposure associations; and (3) to understand the contributions of epidemiology to clinical research, medicine, and public health. *Autumn.*

28210. Colonial Ecologies. (=ANTH 28210/48210, LACS 28210/48210) This seminar explores the historical ecology of European colonial expansion in a comparative framework, concentrating on the production of periphery and the transformation of incorporated societies and environments. In the first half of the quarter, we consider the theoretical frameworks, sources of evidence, and analytical strategies employed by researchers to address the conjunction of environmental and human history in colonial contexts. During the second half of the course, we explore the uses of these varied approaches and lines of evidence in relation to specific cases and trajectories of transformation since the sixteenth century. *M. Lycett. Spring.*

28601. Ideas of Nature I. *Courses in this sequence may be taken individually in any order.* Nature is, and has been, a fundamental category in human thought. Yet Arthur Lovejoy (1935) enumerated sixty-six senses in which the word had been used in European literature and philosophy. We examine the roles that the (nominally continuous) category of “nature” played in sources such as ancient

religious texts, Greek and Roman philosophical writings, and medieval poetry and theology. *A. Gugliotta. Spring. Not offered 2009–10; will be offered 2010–11.*

28602. Ideas of Nature II. *Courses in this sequence may be taken individually in any order.* Raymond Williams writes that a history of the uses of the “keyword” nature “would be a history of a large part of human thought.” This course shares many of the themes and analytical questions of ENST 28601, but extends them to the period from 1400 to 1900. We ask how ideas and images of nature were contested and reconstituted in such contexts as Medicean Florence, Enlightenment France, and ante-Darwinian England. *A. Gugliotta. Spring.*

28700. Environment and the Body. (=HIPS 28601, HIST 25505) From the time of the Hippocratic medical text *Airs, Waters, and Places*, the natural and built environments were understood to shape the states and characteristics of human bodies. This connection is evident through many centuries of medical theory and practice, as well as in arguments advanced for the climatic and geographical determination of racial traits. The relationship between the body and the environment became a matter of particularly intense political struggle in nineteenth-century England and has become so again in our own time. This course examines the history of conceptions of the environmental shaping of human bodies with particular attention to nineteenth- and twentieth-century conflicts over sanitation, disease theories, and poverty, as well as to contemporary debates over toxic contamination and health. *A. Gugliotta. Winter.*

29000. Energy and Energy Policy. (=BPRO 29000, CHSS 37502, ECON 26800, PBPL 29000, PPHA 39201, PSMS 39000) *PQ: Third- or fourth-year standing. PQ for ECON 26800: ECON 26500 and consent of instructor.* This course shows how scientific constraints affect economic and other policy decisions regarding energy, what energy-based issues confront our society and how we may address them through both policy and scientific study, and how the policy and scientific aspects can and should interact. We address specific technologies and the policy questions associated with each, as well as with more overarching aspects of energy policy that may affect several, perhaps many, technologies. *S. Berry, G. Tolley. Autumn.*

ENST 29105. Spoons Full of Sugar: Economic, Political, and Social Repercussions of the Sugar Industry. (=INST 29105, HIST 17103, LACS 29105) This course introduces the political economy of sugar from its evolution as a medicinal treatment for the elite to our daily morning coffee. Students follow sugar’s spread around the world and dissect its relationship to slavery, colonialism, and the emerging global market. By the start of the Revolutionary era, sugar was a major world commodity, serving as the underpinning of empires, countries, and the slave trade. Throughout the nineteenth century, new forces emerged attempting to regulate, protect, or challenge its continued dominance as a sweetener and as a major force in the world economy. Students follow sugar through these changes and into the present-day world of cartels, state regulation, global trade agreements, and zero-calorie sweeteners. A central goal of this course is to expose students to the study of a global industry and methods on

which academics draw to interpret the industry's effects on the economic, social, and political systems in which it operates. This course requires that students think critically about sources and their interpretations. Students who engage thoroughly with course themes come away with a framework to think about the role of commodities in world history and its future. They are also challenged to gain effective communication and writing skills through discussion and essay assignments. *A. Hughes. Autumn.*

29700. Reading and Research. *PQ: Consent of faculty supervisor and program director. Students are required to submit the College Reading and Research Course Form. This course may be counted as one of the electives required for the major. This course is a reading and research course for independent study not related to BA research or BA paper preparation. Autumn, Winter, Spring.*

29801. BA Colloquium I. *PQ: Students must have an approved topic proposal and a faculty reader. Required of students with fourth-year standing who are majoring in Environmental Studies. This colloquium is designed to aid students in their thesis research. Students are exposed to different conceptual frameworks and research strategies. The class meets weekly. Autumn.*

29802. BA Colloquium II. *PQ: Open only to students with fourth-year standing who are majoring in Environmental Studies. Must be taken for P/F grading. This colloquium assists students in conceptualizing, researching, and writing their BA theses. Winter.*

29900. BA Thesis (Reading and Research). *PQ: Consent of instructor and program director. Students are required to submit the College Reading and Research Course Form. This is a reading and research course for independent study related to BA research and BA thesis preparation. Autumn, Winter, Spring.*

III. Environmental Studies Thematic Tracks

Most courses taken beyond the general education requirement that have significant environmental content may be counted in one of the two thematic tracks for the Environmental Studies major or minor. Approved courses for each of these tracks and for the environmental sciences course work requirement are selected quarterly by the faculty. No course may be counted for more than one requirement. For the complete list of approved courses, consult the program adviser or visit pge.uchicago.edu.