

## **Sustainability Course Offerings Inventory**

### Spring 2015

#### Sustainability Focused Courses:

##### AGS 201: Intro to Aging Studies

Course description not offered for this course

##### ART 215: Land & Global Environment

In this sequel to Art 107 students explore specific frameworks and concepts. This course will explore unique and innovative approaches for using art as a catalyst to explore the interrelationships of the physical, biological, cultural, technological systems in our environment through a multidisciplinary approach. Students complete projects to reflect an understanding of these areas using a variety of materials including found objects and natural materials. Students' technical skills in the use of materials and tools are expanded.

##### BIOL 110: Edible Ethics

In this Science Technology in Social Context (STSC) course, we will explore interactions between agricultural production, environmental quality, and human well-being. In addition to covering the science, technology, and ecology of food production, we will also discuss many important philosophical and ethical issues relating to food production and consumption such as pesticide usage, genetically modified food, animal welfare, and veganism. This course will enable identification of value conflicts and provide a framework for discussing them.

##### BIOL 238: Environmental Biology

While recognizing the interrelatedness among different areas of environmental science, this course focuses on how biological and ecological applications relate to environmental issues. Emphasis is on how the human population impacts ecosystem function, giving attention both to population regulation mechanisms and to disruption/conservation of ecosystem processes. Laboratory exercises focus on classical applied ecology as well as field excursions targeting policy and management issues

##### CE 203: Sustainability of Built Systems

This interdisciplinary seminar introduces students to a process for evaluating the sustainability of built systems in both the industrialized and developing worlds. The course addresses the historical, moral, and ethical foundations for the current sustainability movement as well as frameworks that can be used to determine the economic, environmental, and social-equity components of sustainability across the life-cycle of built systems. Throughout the course, we highlight large-scale examples of sustainable built systems.

##### CE 351: Water Resources Engineering

An introductory course in hydraulics, hydrology, and water resources engineering. Topics

include groundwater and surface water supply, flow measurements, flow and pressure losses in pipe systems, probability concepts in design, open channel design including storm sewers and culverts, pump design, and detention basin design.

#### CE 425: Water Supply and Pollution Control

Application of basic principles to the design of water and wastewater systems. Process design and equipment selection for water and wastewater treatment facilities.

#### CHE 370: Alternative Energy Sources

Course description not offered for this course

#### EGRS 230: Environmental Justice

This interdisciplinary course explores the intersection of social justice and environmental stewardship in an attempt to understand the various dimensions of the environmental justice movement and how it affects modern society. Students will be exposed to humanities, social sciences, and environmental science/engineering aspects relevant to the topic.

#### EGRS 352: Energy Tech & Modern World

This course examines the role of energy and energy technologies in the United States and the world. Energy from fossil fuels, nuclear power, and renewable resources is covered. Topics include world resources and recovery of fossil fuels, energy conversion technologies and impacts, nuclear energy and waste disposal, role of energy in global climate change, and emerging renewable energy technologies. Economic and policy issues are integrated with a technical introduction to the energy field.

#### EGRS 480: Sustainable Solutions

Sustainable solutions developed for a complex, real-world project by small groups of multidisciplinary students directed by a faculty advisor, or team of faculty advisors. All projects include significant technical and non technical challenges, and do not have a well-defined solution procedure.

#### EVST 100: Intro to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

#### EVST 215: Environmental Policy

This course examines the ways policy seeks to promote environmental value in our complex and changing world. Students will be introduced to the contemporary environmental policy

landscape, as well as the politics of environmental decision-making. We will examine and critique policy-making processes, policy actors and influence, dominant policy strategies for environmental change, and environmental policy analysis frameworks. We will draw upon case studies from multiple environmental and political contexts to explore class concepts.

#### EVST 290: Climate Change

The Scientific community has explored modern climate change for decades, yet only recently has this issue emerged in the consciousness of the broader society. This writing-intensive, discussion-based seminar will consider the scientific evidence that has climate experts concerned about the future, as well as the significant economic, moral, political, and social issues that human-induced climate change raises. We will explore the challenges as well as the proposed solutions for addressing this global environmental problem.

#### GEOL 110: Environmental Geology

From human perspective on the earth's surface, the planet appears almost infinite. From an Apollo spacecraft, however, earth is simply a larger spaceship with more resources, but nonetheless finite. The course examines the interplay between land-use activity and geologic processes such as flooding, shoreline erosion, and soil erosion. Students explore groundwater resources, geological constraints on waste disposal, and impacts of resource utilization, such as acid rain and the greenhouse effect.

#### HIST 252: Transformation of the American Environment

This course examines the relationship of environment (and environmental change) to American history. Topics include the impact of colonial settlement and 19th century industrial expansion on the environment; the effect of transportation technologies on land use; the conflict between environmental protection and conservation as exemplified in the progressive era battle over construction of Hetch Hetchy Dam in Yosemite National Park; and the origins of environmental movement of the 1960-70's.

#### INDS 211: Interdisciplinary Seminar Life Sciences

Interdisciplinarity in sciences and engineering is no longer the exception as traditional divisions between disciplines erode. Some of the most exciting research in science and engineering is currently happening in the whitespace between disciplines. This course intends to introduce to students to high impact interdisciplinary topics through a combination of primary literature, discussions, and lectures from some of today's high impact academics.

#### INDS 222: Engineers without Borders Practicum

This 0.5 credit course is available to students actively participating in either the management of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

#### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social, technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors.

#### INDS 170: Modern Sub-Saharan Africa

This course combines a firsthand look at the sociocultural environment and natural resources that shape development and change in Kenya and Tanzania. Particular attention is devoted to the rich indigenous history and traditions that provide social and economic purpose for art, the foundations for democratic institutions, support for dignity, industriousness, and accommodation for development. This course examines the degree to which Kenya and Tanzania have achieved their development objectives by managing cultural acculturation, natural resources, and modernization

#### PHIL 155: Environmental Ethics

This course will begin with a brief presentation of prominent ethical theories and concepts important to debates in environmental policy. We will apply these theories and concepts to a range of environmental issues, including population growth, sustainability and our responsibilities to future generations, animal rights, food ethics, and climate change. In addition to reading, discussing and writing about rigorous academic material, students will be required to engage on a practical level with some environmental cause.

#### WGS 262: Women and Work in the Americas

What is work? Who does it and in what capacity? And how does gender influence ideas about and practices of women's and men's labor? In this course we will analyze these questions in specific contexts across the Americas from Argentina to the United States. We will study women's productive and reproductive labor from an intersectional perspective that take into account not only gender but also class, race, ethnicity, sexuality, life stage, and migration status.

#### Courses That Include Sustainability:

A&S 264: Development, Aid and Activism

Course description not offered for this course

#### ART 102: Introduction to Art History II

This course is organized like Art 101, but deals with painting, sculpture, and architecture from the Renaissance to the present.

#### BIOL 102: Introduction to Biology

An introduction to the scientific study of life and basic biological principles. Emphasis is on the properties of living systems, their variety, their relationships in space and time to each other,

evolution and the environment

#### CE 341: Transportation Systems

Technical and policy related aspects of transportation systems. Topics include traffic analysis and control, traffic flow theory, geometric design, capacity analysis and level of service, transportation demand analysis, and transportation planning. Computer applications. Design projects include oral presentations and written reports.

#### CE 451: Open Channel Hydraulics

Application of fluid mechanics principles to flow in open channels. Uniform, gradually varied, rapidly varied, and unsteady flow conditions are analyzed and applied to a variety of practical problems. Both laboratory and computer models are employed.

#### CE 462: Slope Stability and Ground Improvement

This course applies the basic principles of soil mechanics to the analysis of the stability of slopes, walls, dams, and levees. The use of various ground improvement technologies, including geotextile reinforcement, to improve stability and solve construction problems are considered. Includes significant use of computers for analysis. Oral presentation and written reports are required

#### CHE 222: Thermodynamics

Fundamental thermodynamic relationships and their application to non-reactive chemical engineering systems. Equations of state involving ideal and non-ideal behavior. Estimation and use of thermodynamic properties. Analysis of open systems.

#### CHE 321: Unit Operations

Course description not offered for this course

#### CHE 360: Drug Delivery

Mathematical analysis of transport phenomena in biological systems, including pharmacokinetic modeling, diffusion and kinetics of biochemical reactions. Analysis of current drug delivery systems through problem solving, discussion of peer-reviewed literature, and laboratory experiences.

#### CHEM 212: Inorganic Chemistry

Introduces the theories of atomic structure and bonding in main-group and solid-state compounds. Common techniques for characterizing inorganic compounds such as NMR, IR and Mass Spectrometry are discussed. Descriptive chemistry of main group elements is examined. Conductivity, and magnetism, superconductivity and an introduction to bio-inorganic chemistry are additional topics in the course. In lieu of the laboratory students have a project on a topic of their choice.

#### CHEM 213: Inorganic Chemistry w/ Lab

Same as Chemistry 212 plus one three-hour laboratory per week, which includes experience

in the synthesis, purification, and characterization (infrared and electronic spectroscopy, magnetic susceptibility, NMR, cyclic voltammetry, and x-ray powder diffraction) and properties of inorganic compounds.

#### ECON 252: Intermediate Macroeconomic

An examination of aggregate economic activity focusing on the forces that determine the behavior of real GDP, interest rates, and the price level. Economic growth, fluctuations, unemployment, and inflation are analyzed along with alternative policies for dealing with them.

#### ECON 255: Multinational Business and Corporate Social Responsibility

Strategic corporate social responsibility (CSR) is about how a company resolves the dilemmas around its core product or service, how that product is produced, and how and to whom it is marketed. In effect, multi-national corporations which have a business model that uses profit to fuel constant innovation in new products, now have to include, for example, programs to reduce emissions, carbon trading, fair trade practices and differential pricing of general drugs in poor developing countries that demonstrate the potential for CSR; others illustrate the continuing limitations. The object of this course is to make students aware of international business situations that require moral reflection, judgement and decision, while revealing the complexities that often surround business choices and the formation of public policies. Learning through cases of irresponsible actions as well as responsible behavior, the course focuses attention on the study of International Business circumstances in which hard choices must be made under complex conditions of uncertainty and disagreement.

#### ECON 300: Industry, Strategy, Policy

This course serially examines the major sectors of the global economy using the tools of economic theory. For each sector, students analyze current market conditions and trends, financial performance, critical challenges, and relevant public policies.

#### ENG 115: Science Fiction

Science Fiction examines short stories, novels, and films by some of the leading practitioners of the genre. The course considers the genre from literary, cultural, historical, and scientific perspectives

#### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines.

#### GERM 112: Intermediate German

Review of fundamental principles of grammar and syntax and expansion of vocabulary with short literary and cultural readings. Attention to improving reading, sharpening conversational skills, and developing a deeper understanding of the culture of Germany and other German-speaking countries.

#### GOVT 419: Global Governance

This seminar explores the main actors and processes of global governance. We will assess the role of power, international institutions, transnational networks, and ideas. Specific topics of inquiry include global economic governance, the environment, third-world state building, international justice, military intervention, nuclear proliferation, and global terrorism. We will apply competing analytical approaches to different issue areas, as they intersect with the nature and management of global governance in the 21st century. Satisfies exposure to international politics subfield.

#### IA 362: Capstone Seminar in IA

Designed as a capstone seminar to provide an opportunity for the major to bring together, through research and the completion of several papers, his or her various experiences in the discipline. Normally the seminar explores a topic or topics of current international interest through an interdisciplinary approach.

#### Sustainability of Water Systems

Course description not offered for this course

#### SPAN 102: Elementary Spanish

This sequence is for beginners, covering the fundamentals of spoken and written language through the development of reading, writing, speaking, and listening skills.

#### SPAN 303: Spanish Civilization & Culture

An interdisciplinary exploration of the Iberian Peninsula's civilizations and cultures as reflected in its history, literature, peoples, politics, and arts. Topics range from Spanish Unification in 1492 through the rise and fall of Spain as an imperial power.

#### Fall 2014

Sustainability Focused Courses:

#### BIOL 272: Conservation

This course provides students with an introduction to the scientific basis of modern conservation biology and the application of these principles to conservation problems around the world. To understand the complexities involved in making conservation decisions, we will read from many sources, have class and small group discussions, and engage in debate. The objective of the laboratory portion of this course is to provide students with practical, problem-solving experiences in conservation biology beyond the classroom.

#### BIOL 332: Advanced Aquatic Ecology

Students gain familiarity with function and structure of freshwater ecosystems and ecological analysis of biota and abiotic parameters beyond the intermediate level by examining complex interrelationships and synthesizing findings according to theoretical models.

Laboratory/practicum and lecture/seminar are fused by offering this course on our "floating laboratory" pontoon boat at Merrill Creek Reservoir, NJ. Students acquire skills and master techniques by interfacing with naturalists at MCR, enabling them to design, develop, propose and execute a research project with recommendations for environmental management, culminating in presentations to an open Program at the MCR Nature Center.

#### CE 321: Introduction to Environmental Engineering

This course introduces the student to applications of engineering principles to a variety of environmental topics. The topics will revolve around local issues within the Bushkill Watershed, therefore we will adopt a watershed approach to better understand the various topics. Topics include environmental chemistry, hydrology, risk assessment, water supply and pollution control, solid and hazardous wastes, and environmental management. Laboratories consist of field trips, computer modeling exercises, sample collection, and chemical analysis methods.

#### CE 361: Geotechnical Engineering

An introductory course in soil mechanics and geotechnical engineering. Studies include the classification, permeability, consolidation, and strength of soils in lecture and laboratory settings. Written reports for laboratory and design results are required. Discussion of traditional design methods in foundation engineering is included.

#### CE 472: Senior Capstone

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

#### CHE 416: Green Design Analysis

Course description not offered for this course

#### CHEM 252: Environmental Chemistry

This course discusses the chemical principles underlying natural processes and the ways in which human activity affects those processes. Sources, sinks, and interactions of important environmental compounds are investigated.

#### ECON 303: Income Tax Topics

This course introduces students to the concepts and intricacies of federal income tax policies. Students learn to recognize the major transactions inherent in business and financial transactions.



### ECON 354: Contemporary African Economies

Analysis of the contemporary economic environment in Africa: political sociocultural identity and economic structure, trends in public and private capital flows, African regional and international economic institutions, trade development and relations with world markets, investment concessions and risk, with case illustrations from African countries.

### ENG 351: Environmental Writing

This course is designed to engage students in advanced writing about nature and the environment. A central focus of the course will be an examination of the language and rhetoric used to describe these crucial issues in various popular, government, and scholarly contexts.

### EVST 100: Introduction to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

### EVST 255: Rivers & Society

Course description not offered for this course

### EVST 310: Organizations & Environment

As environmental concern deepens, the landscape of organizations seeking to redress environmental degradation has become more complex. Students in this course will examine and evaluate diverse organizational forms and strategies for promoting environmental value. We will cover environmental activism, governmental natural resource agencies, environmental non-governmental organizations, international environmental institutions, and discuss the emergence of "green" business. Students will ground their learning in community-based learning projects with local and regional environmental organizations.

### EVST 363: Environment and Film

Course description not offered for this course

### EVST 315: Food, Culture and Sustainable Societies

We ask, critically, what sustainable and just mean in relation to food and why it matters - and what "culture" has to do with it. To do so we merge well-established studies and work in the anthropology of food with (1) environmental studies of alternative food systems and urban gardening/farming. (2) studies from political ecology engaging a range of analysis on food, (3) critical food studies, which considers race/class/gender/globalism in the context of food.

#### FYS 018: 10 Ways to Know Nature

This class is a study of the different ways we interact with and thus know the natural environment. These ways include, among others, the scientific, technological, artistic, experience-based (hands-on), biographical, and religious; the forms of interaction follow from our lives as consumers, as eaters, and as thinkers, while we work, live, and play. The purpose of the course is to examine how those ways of interaction with nature influence how we know and then treat those environments.

#### FYS 070: Oil, Politics and the Environment

Oil plays a significant part in global economy, politics, and the environment. The control of the oil market has caused wars and conflicts throughout this century. While it is hard to imagine life without petrochemicals, their increasing production has adverse effects on the environment. In addition to a brief review of the geological formation, exploration, drilling, production, and conversion of oil, this course studies the paradoxical role oil has played in shaping the economical and social structure of both exporting and industrial countries.

#### GOVT 231: Global Environmental Politics

Global Environmental Politics bridges international politics and environmental issues, offering an explicit focus on environmental problems and policies in the global context. Students in this course will study the development of global environmental regimes and analyze the successes and continuing deficiencies of political responses to various environmental issues, such as air pollution, water quality, and waste management, climate change, and energy use.

#### HIST 105: History of the Modern World

This course surveys modern world history from 1450 to the present. It focuses on global processes and regional particularities throughout the world (including the United States). Each instructor will choose several themes for students to engage with through targeted readings and class discussion in small sections. In addition, there is a weekly "lab" in which all students enrolled in the class will engage in large group activities like attending outside lectures or watching selected films

#### INDS 211: Interdisciplinary Seminar Life Sciences

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#### INDS 222: Engineers without Borders Practicum

This 0.5 credit course is available to students actively participating in either the management of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership

board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

#### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social, technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors

#### PSYC 230: Lifespan

This is a survey course of the area of Lifespan Development. We will explore the fundamental theories, principles and current research in the field, covering prenatal and child development through older adulthood. The topics we will cover include developmental changes in an individual's biological, physical, cognitive, social, and emotional life over the entire lifespan. We will also explore genetic, contextual, and environmental influences on development.

#### WGS 204: Gender & Environmentalism

This course merges key insights of environmental studies/activism (which focus on relationships between living beings and their environment) and feminism (which focuses on systemic, hierarchical power structures organized by gender difference) and investigates questions of power and knowledge at the intersection of ideas about gender and the environment/nature. We explore forms of environmental activism(s) relative to gender and gender difference (particularly as intersecting with race, class, and sexuality), and reflect on popular attitudes toward environmental issues.

#### Courses That Include Sustainability:

##### BIOL 235: Evolutionary Biology

An introduction to the principles of organic and molecular evolution. Topics include: genetic variation, natural selection, speciation, adaptation, diversification, biogeography, molecular evolution, and the mechanisms underlying each. Laboratory includes experimentation, computer simulation, and relevant reading/presentation of current primary literature in the field

##### CHE 222: Thermo Dynamics

Fundamental thermodynamic relationships and their application to non-reactive chemical engineering systems. Equations of state involving ideal and non-ideal behavior. Estimation and use of thermodynamic properties. Analysis of open systems.

##### CHE 413: Reaction Kinetics

The kinetics of reacting systems and the design of chemical reactors. Analysis of rate data; multistep reaction mechanisms, enzymatic reactions, catalysis and heterogeneous processes; design of single phase isothermal reactors, multiple-phase reactors, non-isothermal reactors, and nonideal reactors.

#### CHE 415: Design Analysis

Quantitative study of current processes. Analysis and flowsheet layout of typical systems; safety, health, environmental, quality control, and ethical concerns in design; economic factors in estimation, design, construction, and operation of process equipment.

#### CHEM 431: Inorganic Chemistry II

This course uses molecular orbital theory to explain the electronic structure and reactivity of inorganic complexes. Topics include symmetry and its applications to bonding and spectroscopy, electronic spectroscopy of transition-metal complexes, mechanisms of substitution and redox processes, organometallic and multinuclear NMR.

#### ECON 202: Environmental Economic

This course is designed to give students a better understanding of how the environment and the economy interact and how public policy can be used to shape this interaction. The course begins by sketching out the flows of natural resources associated with economic activity and how the environmental effects produced by these flows are valued. The course then proceeds to show how market economies affect the environment. Particular emphasis is placed on the environmental damage generated by market economies and how public policy can best be used to address this damage.

#### EGRS 251: Introduction to Engineering and Public Policy

This course introduces students to the governance of science and engineering. Course topics include the overall context for science and engineering policy, the public policy process and institutions involved in that process, and several current science and engineering public policy issues. The course includes a combination of role-playing exercises, debates, and field trips, as well as traditional lectures.

#### EGRS 451: Engineering Studies Senior Seminar

This seminar focuses on how engineering impacts society as well as how society impacts the practice of engineering. Students apply the knowledge they have gained from both engineering and non-engineering courses to evaluate these impacts. Students play an active role in leading sessions, presenting results, organizing class participation, and discussing project results. This is the capstone seminar for the Bachelor of Arts in Engineering.

#### ENG 135: Literature and the Human Experience: Animal Stories

An examination of a significant social or cultural problem as reflected in literary texts. Topics vary from semester to semester and will be announced during the registration period. May be taken more than once with different content.

#### ES 101: Introduction to Engineering Studies

This course teaches the fundamentals of engineering design methodology. Students will use engineering design processes to aid them in: recognizing the need for an engineering

solution, defining constraints, specifying requirements, and modeling an engineering solution, among other aspects of engineering design. Instructors integrate societal contexts of engineering practice into the projects and examine the implications of engineering solutions.

#### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines. Offered as an elective for physics and chemistry majors.

#### FYS 038: Animal Voices

Are human beings the only animals capable of language? That birds and beasts can talk is usually regarded as an artifact of myths, fiction, and fantasy. However, recent findings complicate previously accepted distinctions between human and nonhuman behavior and abilities. This course will consider both scientific and imaginative perspectives on "animal voices." Our readings will come from various disciplines and genres, including animal behavior, linguistics, ethics, medieval fables, graphic novels, and film.

#### GEOL 100: From Ice to Fire

A broad introduction to the geological processes acting within the earth and on its surface that produce volcanoes, earthquakes, mountain belts, mineral deposits, and ocean basins. The course considers the dramatic effects of plate tectonics, as well as the enormous periods of time over which geologic processes take place, also familiar features of the landscape formed by landslides, rivers, groundwater, and glaciers. Practical aspects are learned through discovery-oriented laboratory exercises, which include several field excursions.

#### ME 478: Control Systems

Classical feedback control theory is applied to dynamic systems. The effect of closed-loop control on the transient response, error, stability, and frequency response of systems is investigated. Control systems are designed using computer simulation. Boolean logic and its implementation in ladder logic are applied to the control of mechanical systems. Modern control theory and digital control theory are introduced.

#### REL 224: Religious Ethics

A study of the bases of normative claims about behavior in various religious traditions. Materials from Christian, Jewish, Buddhist, and other religious traditions are used. Topics include freedom, responsibility, and destiny

#### SPAN 111: Intermediate Spanish

Review and expansion of basic grammar and vocabulary. Short literary and cultural readings. Development of reading, writing, listening, and conversational skills as well as a deeper understanding of Hispanic cultures

#### WGS 353: Single Motherhood

This course examines the cultural ideologies, institutions, and public policies that affect single

women's experience of motherhood, with particular attention to the challenges faced by teenage and low-income single mothers. This is a community-based learning and research seminar; outside of class time, students will interact regularly with local teen moms, families living in transitional housing shelters, and/or non-profit agencies that support these women and their children-then engage in collaborative research or activist projects designed to support these members of the Easton community.

### Spring 2014

#### Sustainability Focused Courses:

##### AGS 101: Introduction to Aging Studies

Course description not offered for this course

##### BIOL 231: Ecology

A study of the relationships between organisms and their environment emphasizing basic ecological principles and methods. Laboratory and field exercises illustrate the theoretical concepts discussed in lecture and are writing-intensive.

##### BIOL 110: Edible Ethics

In this Science Technology in Social Context (STSC) course, we will explore interactions between agricultural production, environmental quality, and human well-being. In addition to covering the science, technology, and ecology of food production, we will also discuss many important philosophical and ethical issues relating to food production and consumption such as pesticide usage, genetically modified food, animal welfare, and veganism. This course will enable identification of value conflicts and provide a framework for discussing them.

##### CE 351: Water Resources Engineering

An introductory course in hydraulics, hydrology, and water resources engineering. Topics include groundwater and surface water supply, flow measurements, flow and pressure losses in pipe systems, probability concepts in design, open channel design including storm sewers and culverts, pump design, and detention basin design.

##### CE 422: Environmental Site Assessment

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

##### CE 464: Environmental Geophysics

Introduction to the geophysical techniques used to study large- and small-scale features and

processes of the Earth. Emphasis is placed on the fundamental principles of gravity, magnetism, seismology, heat transfer, and electrical methods as they apply to environmental problems.

#### CE 473: Senior Capstone II

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

#### EGRS 352: Energy Technology & the Modern World

This course examines the role of energy and energy technologies in the United States and the world. Energy from fossil fuels, nuclear power, and renewable resources is covered. Topics include world resources and recovery of fossil fuels, energy conversion technologies and impacts, nuclear energy and waste disposal, role of energy in global climate change, and emerging renewable energy technologies. Economic and policy issues are integrated with a technical introduction to the energy field.

#### EGRS 373: Technology & Nature

This course examines the sometimes-contentious relationship between the natural world and human attempts to understand it (science) and manage it (technology). It addresses historical, ethical, artistic, and scientific distinctions between the natural and the human-built world, with examples from food and agriculture, modes of transportation, river control, factories, and more. The purpose of the course is to help students develop a nuanced understanding of the interactions amongst and between technology and nature.

#### EGRS 480: Sustainable Solutions

Sustainable solutions developed for a complex, real-world project by small groups of multidisciplinary students directed by a faculty advisor, or team of faculty advisors. All projects include significant technical and non technical challenges, and do not have a well-defined solution procedure.

#### EVST 100: Introduction to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

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### EVST 225: Rivers & Society

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### EVST 290: Climate Change

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### GEOL 110: Environmental Geology

From human perspective on the earth's surface, the planet appears almost infinite. From an Apollo spacecraft, however, earth is simply a larger spaceship with more resources, but nonetheless finite. The course examines the interplay between land-use activity and geologic processes such as flooding, shoreline erosion, and soil erosion. Students explore groundwater resources, geological constraints on waste disposal, and impacts of resource utilization, such as acid rain and the greenhouse effect.

### GEOL 322: Environmental Geophysics

Introduction to the geophysical techniques used to study large- and small-scale features and processes of the Earth. Emphasis placed on the fundamental principles of gravity, magnetism, seismology, heat transfer, and electrical methods as they apply to environmental problems through classroom lectures and laboratory and field exercises.

### INDS 211: Interdisciplinary Seminar in Life Science

Interdisciplinarity in sciences and engineering is no longer the exception as traditional divisions between disciplines erode. Some of the most exciting research in science and engineering is currently happening in the whitespace between disciplines. This course intends to introduce to students to high impact interdisciplinary topics through a combination of primary literature, discussions, and lectures from some of today's high impact academics.

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of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

#### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social, technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors.

#### ME 250: Energy & Global Climate Change

This seminar will explore scientific, ethical, political, technological, and social issues regarding the global climate change, energy needs of the society, energy conversion and sustainability. Science shows that increased carbon dioxide in the atmosphere is causing the global warming. Since there is no consensus about this viewpoint in the areas of politics, economics, and policy making, the seminar will offer a rich forum of discussions of opposing views. Increased fossil energy use driven by population explosion will also be discussed.

#### PHIL 255: Environmental Ethics

This course will begin with a brief presentation of prominent ethical theories and concepts important to debates in environmental policy. We will apply these theories and concepts to a range of environmental issues, including population growth, sustainability and our responsibilities to future generations, animal rights, food ethics, and climate change. In addition to reading, discussing and writing about rigorous academic material, students will be required to engage on a practical level with some environmental cause.

#### VAST 203: Sustainability of Built Systems

This interdisciplinary seminar introduces students to a process for evaluating the sustainability of built systems in both the industrialized and developing worlds. The course addresses the historical, moral, and ethical foundations for the current sustainability movement as well as frameworks that can be used to determine the economic, environmental, and social-equity components of sustainability across the life-cycle of built systems. Throughout the course, we highlight large-scale examples of sustainable built systems.

#### Courses that Include Sustainability:

##### A&S 102: Cultural Anthropology

Course description not offered for this course

##### ART 102: Introduction to Art History II

This course is organized like Art 101, but deals with painting, sculpture, and architecture from the Renaissance to the present.

#### BIOL 102: General Biology

An introduction to the scientific study of life and basic biological principles. Emphasis is on the properties of living systems, their variety, their relationships in space and time to each other, evolution and the environment

#### BIOL 224: Plant Form and Function

This course will cover the general structure and organization of the plant body and the varied architectural alternatives that plants have evolved with respect to both form and function of growth and reproduction in each of the major terrestrial and aquatic biomes. The course is comprised of lectures, discussions, laboratories, guided and independent investigations, presentations, and field trips. Lecture and laboratory are integrated in the time allotted for this class.

#### CE 341: Transportation Systems

Technical and policy related aspects of transportation systems. Topics include traffic analysis and control, traffic flow theory, geometric design, capacity analysis and level of service, transportation demand analysis, and transportation planning. Computer applications. Design projects include oral presentations and written reports.

#### CHE 321: Unit Operations

Course description not offered for this course

#### CHEM 212: Inorganic Chemistry

Introduces the theories of atomic structure and bonding in main-group and solid-state compounds. Common techniques for characterizing inorganic compounds such as NMR, IR and Mass Spectrometry are discussed. Descriptive chemistry of main group elements is examined. Conductivity, and magnetism, superconductivity and an introduction to bio-inorganic chemistry are additional topics in the course. In lieu of the laboratory students have a project on a topic of their choice.

#### CHEM 213: Inorganic Chemistry w/ Lab

Same as Chemistry 212 plus one three-hour laboratory per week, which includes experience in the synthesis, purification, and characterization (infrared and electronic spectroscopy, magnetic susceptibility, NMR, cyclic voltammetry, and x-ray powder diffraction) and properties of inorganic compounds.

#### ECE 492: Design Lab II

In this course individual or team design projects are completed. The course includes both laboratory and library work. Initial proposals, progress reports, and final design documents are required. Projects can cover the entire spectrum of activities within electrical engineering.

#### ECON 202: Environmental Economics

This course is designed to give students a better understanding of how the environment and the economy interact and how public policy can be used to shape this interaction. The course begins by sketching out the flows of natural resources associated with economic activity and how the environmental effects produced by these flows are valued. The course then proceeds to show how market economies affect the environment. Particular emphasis is placed on the environmental damage generated by market economies and how public policy can best be used to address this damage.

#### ECON 300: Industry, Strategy, Policy

This course serially examines the major sectors of the global economy using the tools of economic theory. For each sector, students analyze current market conditions and trends, financial performance, critical challenges, and relevant public policies.

#### ENG 115: Science Fiction

Science Fiction examines short stories, novels, and films by some of the leading practitioners of the genre. The course considers the genre from literary, cultural, historical, and scientific perspectives

#### ENG 135: Literature and Human Experience: Animal Stories

An examination of a significant social or cultural problem as reflected in literary texts. Topics vary from semester to semester and will be announced during the registration period. May be taken more than once with different content.

#### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines.

#### GEOL 205: Oceanography

Exploration of the physical, chemical, and biological systems of the oceans and human impacts on these systems. Topics include marine geology, seawater composition, waves, tides, coastal and open ocean processes, marine ecosystems, and ocean pollution. Weekend field trips explore barrier island environments and erosion along the New Jersey coast; oceanographic sampling techniques on Seneca Lake; and pollution of the New England coast

#### GOVT 419: Global Governance

This seminar explores the main actors and processes of global governance. We will assess the role of power, international institutions, transnational networks, and ideas. Specific topics of inquiry include global economic governance, the environment, third-world state building, international justice, military intervention, nuclear proliferation, and global terrorism. We will apply competing analytical approaches to different issue areas, as they intersect with the

nature and management of global governance in the 21st century. Satisfies exposure to international politics subfield.

#### HIST 215: History of Technology

A study of technology from the irrigation cities of the ancient world through militarily financed systems of the late twentieth century. The course stresses the important role played by cultural influences in determining the nature, extent, and direction of technological development. Attention focuses on processes of invention and innovation and their impact on the growth of modern Western civilization.

#### IA 362: Capstone Seminar in IA

Designed as a capstone seminar to provide an opportunity for the major to bring together, through research and the completion of several papers, his or her various experiences in the discipline. Normally the seminar explores a topic or topics of current international interest through an interdisciplinary approach.

#### REL 102: Contemporary Religious Issues

An exploration of how religious people and ideas shape contemporary life. The course examines religiously-influenced issues such as the separation of church and state, the role of religion in violence and terrorism, and debates between religion and science. The course also looks at positive roles of religion and spirituality in modern culture.

#### REL 224: Religious Ethics

A study of the bases of normative claims about behavior in various religious traditions. Materials from Christian, Jewish, Buddhist, and other religious traditions are used. Topics include freedom, responsibility, and destiny

#### REL 240: Theories of Religion

What is religion? What is the nature of religious belief? What roles does religion play in society? How can we study and understand religion? There have been many attempts to answer these questions from sociology, anthropology, philosophy, psychology, comparative religion, and the feminist critique of religion. This course examines representative theories of the nature and study of religion, paying close attention to the contexts within which these theories arise, and how effective they are in leading to an understanding of religious beliefs and practices

#### SPAN 102: Elementary Spanish

This sequence is for beginners, covering the fundamentals of spoken and written language through the development of reading, writing, speaking, and listening skills.

#### VAST 209: Indigo: A World of Blues

Dip white fabric in the muddy-colored indigo dye vat and the cloth emerges green, then slowly turns azure, cobalt or sapphire before your eyes. The chemistry behind this reaction will be

revealed - and practiced - in this course. This mysterious dye has an intriguing history, and we will study its societal and environmental impact. We will learn about the equipment used in producing indigo dye, and the three sources of indigo: synthetic, natural, and biosynthetic. The course will culminate with the design of a new indigo production facility.

### Fall 2013

#### Sustainability Focused Courses:

##### BIOL 234: Environmental Biology

While recognizing the interrelatedness among different areas of environmental science, this course focuses on how biological and ecological applications relate to environmental issues. Emphasis is on how the human population impacts ecosystem function, giving attention both to population regulation mechanisms and to disruption/conservation of ecosystem processes. Laboratory exercises focus on classical applied ecology as well as field excursions targeting policy and management issues

##### BIOL 272: Conservation Biology

This course provides students with an introduction to the scientific basis of modern conservation biology and the application of these principles to conservation problems around the world. To understand the complexities involved in making conservation decisions, we will read from many sources, have class and small group discussions, and engage in debate. The objective of the laboratory portion of this course is to provide students with practical, problem-solving experiences in conservation biology beyond the classroom.

##### BIOL 341: Environmental Issues with Aquatic Ecosystems

In this course, students will learn about major global environmental issues in freshwater, marine, and estuarine ecosystems. Students are expected to critically read, evaluate, present, and discuss current events and primary literature. Examples of some topics include chronic effects of nutrient over-enrichment, chemical environmental contaminants, harmful algae, overfishing, and biological invaders. In the practicum, students will be introduced to laboratory and field techniques that aquatic ecologists often use to assess and find practical solutions to water quality problems.

##### CE 341: Environmental Engineering

This course introduces the student to applications of engineering principles to a variety of environmental topics. The topics will revolve around local issues within the Bushkill Watershed, therefore we will adopt a watershed approach to better understand the various topics. Topics include environmental chemistry, hydrology, risk assessment, water supply and pollution control, solid and hazardous wastes, and environmental management. Laboratories consist of field trips, computer modeling exercises, sample collection, and chemical analysis methods.

##### CE 413: Design of Concrete Structures

This course focuses on the mechanics and design of components of reinforced concrete structures and builds upon the knowledge gained in CE 311. Extensive use of the ACI 318 design code is made. Topics include concrete and reinforcement properties, slender beams, deep beams, T-beams, shear, torsion, columns, one- and two-way slabs, walls, footings, and reinforcement splicing and development lengths. Introduction to prestressed concrete structures.

#### CE 444: Civil Infrastructure Systems Management

This course presents an integrated approach to the management of civil infrastructure systems. Students examine the many aspects of performance and different management approaches in the context of available tools, new technologies, institutional issues, and resource constraints.

#### CE 472: Senior Capstone Design

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

#### CHE 370: Alternative Energy Sources

Course description not offered for this course

#### EGRS 352: Energy Technology & the Modern World

This course examines the role of energy and energy technologies in the United States and the world. Energy from fossil fuels, nuclear power, and renewable resources is covered. Topics include world resources and recovery of fossil fuels, energy conversion technologies and impacts, nuclear energy and waste disposal, role of energy in global climate change, and emerging renewable energy technologies. Economic and policy issues are integrated with a technical introduction to the energy field.

#### EVST 100: Introduction to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

#### EVST 310: Organizations & the Environment

As environmental concern deepens, the landscape of organizations seeking to redress environmental degradation has become more complex. Students in this course will examine and evaluate diverse organizational forms and strategies for promoting environmental value. We will cover environmental activism, governmental natural resource agencies, environmental non-governmental organizations, international environmental institutions, and discuss the emergence of "green" business. Students will ground their learning in community-based learning projects with local and regional environmental organizations.

#### GOVT 231: Global Environmental Politics

Global Environmental Politics bridges international politics and environmental issues, offering an explicit focus on environmental problems and policies in the global context. Students in this course will study the development of global environmental regimes and analyze the successes and continuing deficiencies of political responses to various environmental issues, such as air pollution, water quality, and waste management, climate change, and energy use.

#### INDS 211: Interdisciplinary Seminar in Life Science

Interdisciplinarity in sciences and engineering is no longer the exception as traditional divisions between disciplines erode. Some of the most exciting research in science and engineering is currently happening in the whitespace between disciplines. This course intends to introduce to students to high impact interdisciplinary topics through a combination of primary literature, discussions, and lectures from some of today's high impact academics.

#### INDS 222: Engineers without Borders Practicum

This 0.5 credit course is available to students actively participating in either the management of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

#### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social, technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors.

#### PSYC 234: Adult Development and Aging

Course description not offered for this course

#### WGS 262: Women & Work in America

What is work? Who does it and in what capacity? And how does gender influence ideas about and practices of women's and men's labor? In this course we will analyze these questions in specific contexts across the Americas from Argentina to the United States. We will study women's productive and reproductive labor from an intersectional perspective that take into

account not only gender but also class, race, ethnicity, sexuality, life stage, and migration status.

#### FYS 018: 10 Ways to Know Nature

This class is a study of the different ways we interact with and thus know the natural environment. These ways include, among others, the scientific, technological, artistic, experience-based (hands-on), biographical, and religious; the forms of interaction follow from our lives as consumers, as eaters, and as thinkers, while we work, live, and play. The purpose of the course is to examine how those ways of interaction with nature influence how we know and then treat those environments.

#### Courses That Include Sustainability:

##### BIOL 235: Evolutionary Biology

An introduction to the principles of organic and molecular evolution. Topics include: genetic variation, natural selection, speciation, adaptation, diversification, biogeography, molecular evolution, and the mechanisms underlying each. Laboratory includes experimentation, computer simulation, and relevant reading/presentation of current primary literature in the field

##### CE 421: Hydrology

Introduction to engineering hydrology, primarily dealing with surface waters. Topics include hydrologic cycle, frequency analysis, rainfall/runoff relationships, routing, and stormwater management and design. Design problems using current hydrological computer models are assigned.

##### CE 444: Civil Infrastructure Systems Management

This course presents an integrated approach to the management of civil infrastructure systems. Students examine the many aspects of performance and different management approaches in the context of available tools, new technologies, institutional issues, and resource constraints.

##### CHE 413: Reaction Kinetics

The kinetics of reacting systems and the design of chemical reactors. Analysis of rate data; multistep reaction mechanisms, enzymatic reactions, catalysis and heterogeneous processes; design of single phase isothermal reactors, multiple-phase reactors, non-isothermal reactors, and nonideal reactors.

##### CHE 360: Drug Delivery

Mathematical analysis of transport phenomena in biological systems, including pharmacokinetic modeling, diffusion and kinetics of biochemical reactions. Analysis of current drug delivery systems through problem solving, discussion of peer-reviewed literature, and laboratory experiences.

##### CHEM 431: Inorganic Chemistry II

This course uses molecular orbital theory to explain the electronic structure and reactivity of



inorganic complexes. Topics include symmetry and its applications to bonding and spectroscopy, electronic spectroscopy of transition-metal complexes, mechanisms of substitution and redox processes, organometallic and multinuclear NMR.

#### EGRS 451: Engineering Studies Senior Seminar

This seminar focuses on how engineering impacts society as well as how society impacts the practice of engineering. Students apply the knowledge they have gained from both engineering and non-engineering courses to evaluate these impacts. Students play an active role in leading sessions, presenting results, organizing class participation, and discussing project results. This is the capstone seminar for the Bachelor of Arts in Engineering.

#### EGRS 251: Introduction to Engineering and Public Policy

This course introduces students to the governance of science and engineering. Course topics include the overall context for science and engineering policy, the public policy process and institutions involved in that process, and several current science and engineering public policy issues. The course includes a combination of role-playing exercises, debates, and field trips, as well as traditional lectures.

#### ES 101: Introduction to Engineering Studies

This course teaches the fundamentals of engineering design methodology. Students will use engineering design processes to aid them in: recognizing the need for an engineering solution, defining constraints, specifying requirements, and modeling an engineering solution, among other aspects of engineering design. Instructors integrate societal contexts of engineering practice into the projects and examine the implications of engineering solutions.

#### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines.

#### REL 102: Contemporary Religious Issues

An exploration of how religious people and ideas shape contemporary life. The course examines religiously-influenced issues such as the separation of church and state, the role of religion in violence and terrorism, and debates between religion and science. The course also looks at positive roles of religion and spirituality in modern culture.

#### SPAN 112: Intermediate Spanish

Review and expansion of basic grammar and vocabulary. Short literary and cultural readings. Development of reading, writing, listening, and conversational skills as well as a deeper understanding of Hispanic cultures.

#### SPAN 303: Spanish Civilizations & Culture

An interdisciplinary exploration of the Iberian Peninsula's civilizations and cultures as reflected

in its history, literature, peoples, politics, and arts. Topics range from Spanish Unification in 1492 through the rise and fall of Spain as an imperial power.

#### WGS 353: Single Motherhood

This course examines the cultural ideologies, institutions, and public policies that affect single women's experience of motherhood, with particular attention to the challenges faced by teenage and low-income single mothers. This is a community-based learning and research seminar; outside of class time, students will interact regularly with local teen moms, families living in transitional housing shelters, and/or non-profit agencies that support these women and their children-then engage in collaborative research or activist projects designed to support these members of the Easton community.

#### Spring 2013

##### Sustainability Focused Courses:

#### BIOL 270: Special Topics in Environmental Biology

Depending upon student and staff interests, one or more specialized areas of biology may be offered.

#### CE 351: Water Resources Engineering

An introductory course in hydraulics, hydrology, and water resources engineering. Topics include groundwater and surface water supply, flow measurements, flow and pressure losses in pipe systems, probability concepts in design, open channel design including storm sewers and culverts, pump design, and detention basin design.

#### CE 472: Senior Capstone Design II

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

#### ECON 354: Contemporary African Economics

Analysis of the contemporary economic environment in Africa: political sociocultural identity and economic structure, trends in public and private capital flows, African regional and international economic institutions, trade development and relations with world markets, investment concessions and risk, with case illustrations from African countries.

#### EGRS 373: Technology and Society

This course examines the sometimes-contentious relationship between the natural world and human attempts to understand it (science) and manage it (technology). It addresses historical,

ethical, artistic, and scientific distinctions between the natural and the human-built world, with examples from food and agriculture, modes of transportation, river control, factories, and more. The purpose of the course is to help students develop a nuanced understanding of the interactions amongst and between technology and nature.

#### EGRS 480: Sustainable Solutions

Sustainable solutions developed for a complex, real-world project by small groups of multidisciplinary students directed by a faculty advisor, or team of faculty advisors. All projects include significant technical and non technical challenges, and do not have a well-defined solution procedure.

#### ENG 351: Environmental Writing

This course is designed to engage students in advanced writing about nature and the environment. A central focus of the course will be an examination of the language and rhetoric used to describe these crucial issues in various popular, government, and scholarly contexts.

#### EVST 100 Introduction to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

#### EVST 253: Gender, Race & Environmental Justice

This course explores connections between environmental issues and hierarchies of social power. The course investigates how systemic social hierarchies of dis/advantage-principally gender and racial/ethnic identity-are articulated through the environment and how the environment is shaped by dynamics of gender/race inequalities. Additional analytical lenses (sexuality, socio-economic class, and global position) are used to form conceptual frameworks that improve our understanding of the important role "environmental justice" plays in the study of systemic social inequalities.

#### EVST 310: Organizations & Environment

As environmental concern deepens, the landscape of organizations seeking to redress environmental degradation has become more complex. Students in this course will examine and evaluate diverse organizational forms and strategies for promoting environmental value. We will cover environmental activism, governmental natural resource agencies, environmental non-governmental organizations, international environmental institutions, and discuss the emergence of "green" business. Students will ground their learning in community-based learning projects with local and regional environmental organizations.

### EVST 290: Climate Change

The Scientific community has explored modern climate change for decades, yet only recently has this issue emerged in the consciousness of the broader society. This writing-intensive, discussion-based seminar will consider the scientific evidence that has climate experts concerned about the future, as well as the significant economic, moral, political, and social issues that human-induced climate change raises. We will explore the challenges as well as the proposed solutions for addressing this global environmental problem.

### GEOL 110: Environmental Geology

From human perspective on the earth's surface, the planet appears almost infinite. From an Apollo spacecraft, however, earth is simply a larger spaceship with more resources, but nonetheless finite. The course examines the interplay between land-use activity and geologic processes such as flooding, shoreline erosion, and soil erosion. Students explore groundwater resources, geological constraints on waste disposal, and impacts of resource utilization, such as acid rain and the greenhouse effect.

### HIST 252: Transforming the American Environment

This course examines the relationship of environment (and environmental change) to American history. Topics include the impact of colonial settlement and 19th century industrial expansion on the environment; the effect of transportation technologies on land use; the conflict between environmental protection and conservation as exemplified in the progressive era battle over construction of Hetch Hetchy Dam in Yosemite National Park; and the origins of environmental movement of the 1960-70's.

### INDS 211: Interdisciplinary Seminar Life Sciences

Interdisciplinarity in sciences and engineering is no longer the exception as traditional divisions between disciplines erode. Some of the most exciting research in science and engineering is currently happening in the whitespace between disciplines. This course intends to introduce to students to high impact interdisciplinary topics through a combination of primary literature, discussions, and lectures from some of today's high impact academics.

### INDS 222: Engineers without Borders Practicum

This 0.5 credit course is available to students actively participating in either the management of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social,

technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors.

#### MATH 256: Evolutionary Game Theory

An introduction to the concepts, techniques, and application of evolutionary game theory. The mathematics of game theory and natural selection offer insights valuable to the study of economics, biology, psychology, anthropology, sociology, philosophy, and political science. This course is intended to serve students with interests in any of these fields learn the approach, requiring minimal mathematical background, with special attention to apparent paradoxes, such as the evolution of altruism.

#### VAST 203: Sustainability of Built Systems

This interdisciplinary seminar introduces students to a process for evaluating the sustainability of built systems in both the industrialized and developing worlds. The course addresses the historical, moral, and ethical foundations for the current sustainability movement as well as frameworks that can be used to determine the economic, environmental, and social-equity components of sustainability across the life-cycle of built systems. Throughout the course, we highlight large-scale examples of sustainable built systems.

#### VAST 206: AIDS: A Modern Pandemic

This course examines the world AIDS epidemic, with primary emphasis on the U.S. and secondary emphasis on Africa. Scientific topics include the biology of HIV, the human immune system, HIV drugs and therapies, and the progression of an HIV infection, which is also considered from a humanistic perspective. Political, economic, historical, and cultural factors influencing the spread of the epidemic and its control are discussed, as is the tension between individual liberties and the protection of public health.

#### VAST 244: Comparative Tax Policy & Social Change

The effects of tax policy can be far reaching and can have a positive impact on the lives of the citizens of a country. Tax policy can be fraught with ineffectiveness, waste, and be deemed a failure. Some countries have enhanced effective policies which are favorable to specific goals established by its leaders, including energy security, health care security, and food/agriculture security, while other countries have failed in this regard. In this class we will examine the tax structures of nations in the developed world, in the developing world and in the third-world, focusing on the areas of energy, health, and food. We will discuss the basic scientific/technological issues that reasonable national policies in these areas ought to address and then investigate how tax policies can help do exactly that. What characteristics are necessary and sufficient to develop an effective tax policy? How can one fairly judge a tax policy in terms of both basic fairness and achievement of important social goals?

Courses That Include Sustainability:

#### A&S 102: Cultural Anthropology

Course description not offered for this course

#### ART 102: Introduction to Art History II

This course is organized like Art 101, but deals with painting, sculpture, and architecture from the Renaissance to the present.

#### BIOL 102: General Biology

An introduction to the scientific study of life and basic biological principles. Emphasis is on the properties of living systems, their variety, their relationships in space and time to each other, evolution and the environment

#### BIOL 224: Plant Form and Function

This course will cover the general structure and organization of the plant body and the varied architectural alternatives that plants have evolved with respect to both form and function of growth and reproduction in each of the major terrestrial and aquatic biomes. The course is comprised of lectures, discussions, laboratories, guided and independent investigations, presentations, and field trips. Lecture and laboratory are integrated in the time allotted for this class.

#### CE 421: Hydrology

Introduction to engineering hydrology, primarily dealing with surface waters. Topics include hydrologic cycle, frequency analysis, rainfall/runoff relationships, routing, and stormwater management and design. Design problems using current hydrological computer models are assigned.

#### CE 341: Transportation Systems

Technical and policy related aspects of transportation systems. Topics include traffic analysis and control, traffic flow theory, geometric design, capacity analysis and level of service, transportation demand analysis, and transportation planning. Computer applications. Design projects include oral presentations and written reports.

#### CE 462: Slope Stability and Ground Improvement

This course applies the basic principles of soil mechanics to the analysis of the stability of slopes, walls, dams, and levees. The use of various ground improvement technologies, including geotextile reinforcement, to improve stability and solve construction problems are considered. Includes significant use of computers for analysis. Oral presentation and written reports are required

#### CHE 422: Design Synthesis

This capstone design course provides opportunities for the application of all prior course work in the resolution of an industrially realistic or derived chemical process design problem in a

team format. Teams demonstrate a practical ability to define the required technical challenge, develop relevant criteria to evaluate alternatives, and present the resolution of the technical challenge in both oral and written formats

#### CHEM 212: Inorganic Chemistry

Introduces the theories of atomic structure and bonding in main-group and solid-state compounds. Common techniques for characterizing inorganic compounds such as NMR, IR and Mass Spectrometry are discussed. Descriptive chemistry of main group elements is examined. Conductivity, and magnetism, superconductivity and an introduction to bio-inorganic chemistry are additional topics in the course. In lieu of the laboratory students have a project on a topic of their choice.

#### CHEM 213: Inorganic Chemistry with Lab

Same as Chemistry 212 plus one three-hour laboratory per week, which includes experience in the synthesis, purification, and characterization (infrared and electronic spectroscopy, magnetic susceptibility, NMR, cyclic voltammetry, and x-ray powder diffraction) and properties of inorganic compounds.

#### ECON 202: Environmental Economics

This course is designed to give students a better understanding of how the environment and the economy interact and how public policy can be used to shape this interaction. The course begins by sketching out the flows of natural resources associated with economic activity and how the environmental effects produced by these flows are valued. The course then proceeds to show how market economies affect the environment. Particular emphasis is placed on the environmental damage generated by market economies and how public policy can best be used to address this damage.

#### ECON 300: Industry, Strategy, Policy

This course serially examines the major sectors of the global economy using the tools of economic theory. For each sector, students analyze current market conditions and trends, financial performance, critical challenges, and relevant public policies.

#### EGRS 251: Introduction to Engineering and Public Policy

This course introduces students to the governance of science and engineering. Course topics include the overall context for science and engineering policy, the public policy process and institutions involved in that process, and several current science and engineering public policy issues. The course includes a combination of role-playing exercises, debates, and field trips, as well as traditional lectures.

#### EGRS 451: Engineering Studies Senior Seminar

This seminar focuses on how engineering impacts society as well as how society impacts the practice of engineering. Students apply the knowledge they have gained from both engineering and non-engineering courses to evaluate these impacts. Students play an active

role in leading sessions, presenting results, organizing class participation, and discussing project results. This is the capstone seminar for the Bachelor of Arts in Engineering.

#### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines.

#### IA 362: Capstone Seminar in IA

Designed as a capstone seminar to provide an opportunity for the major to bring together, through research and the completion of several papers, his or her various experiences in the discipline. Normally the seminar explores a topic or topics of current international interest through an interdisciplinary approach.

#### REL 490: Religion Capstone

Students who major in religion develop a capstone project under the direction of a faculty member in the department, following the established, written guidelines available in the department. This takes place in the first semester of the senior year.

#### SPAN 102: Elementary Spanish

This sequence is for beginners, covering the fundamentals of spoken and written language through the development of reading, writing, speaking, and listening skills.

#### WGS 353: Single Motherhood

This course examines the cultural ideologies, institutions, and public policies that affect single women's experience of motherhood, with particular attention to the challenges faced by teenage and low-income single mothers. This is a community-based learning and research seminar; outside of class time, students will interact regularly with local teen moms, families living in transitional housing shelters, and/or non-profit agencies that support these women and their children-then engage in collaborative research or activist projects designed to support these members of the Easton community.

#### Fall 2012

##### Sustainability Focused Courses:

#### BIOL 231: Ecology

A study of the relationships between organisms and their environment emphasizing basic ecological principles and methods. Laboratory and field exercises illustrate the theoretical concepts discussed in lecture and are writing-intensive.

#### BIOL 332: Advanced Aquatic Biology

Students gain familiarity with function and structure of freshwater ecosystems and ecological analysis of biota and abiotic parameters beyond the intermediate level by examining complex



interrelationships and synthesizing findings according to theoretical models.

Laboratory/practicum and lecture/seminar are fused by offering this course on our "floating laboratory" pontoon boat at Merrill Creek Reservoir, NJ. Students acquire skills and master techniques by interfacing with naturalists at MCR, enabling them to design, develop, propose and execute a research project with recommendations for environmental management, culminating in presentations to an open Program at the MCR Nature Center.

#### CE 321: Introduction to Environmental Engineering

This course introduces the student to applications of engineering principles to a variety of environmental topics. The topics will revolve around local issues within the Bushkill Watershed, therefore we will adopt a watershed approach to better understand the various topics. Topics include environmental chemistry, hydrology, risk assessment, water supply and pollution control, solid and hazardous wastes, and environmental management. Laboratories consist of field trips, computer modeling exercises, sample collection, and chemical analysis methods.

#### CE 361: Geotechnical Engineering

An introductory course in soil mechanics and geotechnical engineering. Studies include the classification, permeability, consolidation, and strength of soils in lecture and laboratory settings. Written reports for laboratory and design results are required. Discussion of traditional design methods in foundation engineering is included.

#### CE 472: Senior Capstone Design I

Students work in teams to complete two projects in two different areas of civil engineering and initiate a third project to be completed during the subsequent semester in Design II - CE 473. The projects are intended to provide design experience in varying areas of the civil engineering discipline. The content of this course will expose students to open-ended design problems (i.e. problems with more than one possible "answer") and provide an opportunity for students to utilize many of the skills learned in previous courses within the civil engineering discipline.

#### CHE 370: Alternative Energy Sources

Course description not offered for this course

#### CHEM 252: Environmental Chemistry

This course discusses the chemical principles underlying natural processes and the ways in which human activity affects those processes. Sources, sinks, and interactions of important environmental compounds are investigated.

#### EGRS 352: Energy Technology & the Modern World

This course examines the role of energy and energy technologies in the United States and the world. Energy from fossil fuels, nuclear power, and renewable resources is covered. Topics include world resources and recovery of fossil fuels, energy conversion technologies and

impacts, nuclear energy and waste disposal, role of energy in global climate change, and emerging renewable energy technologies. Economic and policy issues are integrated with a technical introduction to the energy field.

#### EVST 100: Intro to the Environment

An Interdisciplinary course that introduces students to the major issues in environmental studies. We emphasize the importance of analyzing environmental issues from a comprehensive systems approach. The course focuses on the interaction of natural, socioeconomic, political, and ethical systems, using case studies to highlight the need to examine environmental issues from multiple perspectives. Case studies include: "clean" coal, ocean depletion policy, and energy and transportation systems and the environment. Case studies are likely to change from year to year.

#### FYS 141: The Mathematics of Social Justice

Alexander Hamilton said, "The first duty of society is justice." Today there is vociferous argument about the prevalence of justice. To what degree is society just? Are there practical ways to make it more just? This course considers the importance of understanding data and applying mathematics to ask these questions and to explore meaningful answers. Using mathematics that everybody is taught, we'll try to make sense out of conflicting opinions, so as to discover the importance of quantitative literacy for all citizens in a democracy.

#### FYS: 018: 10 Ways to Know Nature

This class is a study of the different ways we interact with and thus know the natural environment. These ways include, among others, the scientific, technological, artistic, experience-based (hands-on), biographical, and religious; the forms of interaction follow from our lives as consumers, as eaters, and as thinkers, while we work, live, and play. The purpose of the course is to examine how those ways of interaction with nature influence how we know and then treat those environments.

#### GOVT 231: Global Environmental Politics

Global Environmental Politics bridges international politics and environmental issues, offering an explicit focus on environmental problems and policies in the global context. Students in this course will study the development of global environmental regimes and analyze the successes and continuing deficiencies of political responses to various environmental issues, such as air pollution, water quality, and waste management, climate change, and energy use.

#### INDS 211: Interdisciplinary Seminar Life Sciences

Interdisciplinarity in sciences and engineering is no longer the exception as traditional divisions between disciplines erode. Some of the most exciting research in science and engineering is currently happening in the whitespace between disciplines. This course intends to introduce to students to high impact interdisciplinary topics through a combination of primary literature, discussions, and lectures from some of today's high impact academics.

#### INDS 222: Engineers without Borders Practicum

This 0.5 credit course is available to students actively participating in either the management of or the development of technical or socio-cultural solutions for Engineers without Borders service-learning projects. For the former, students should be members of the leadership board and participate in weekly board meetings and other EWB activities. For the latter, significant work on a technical or socio-cultural project must be completed. Grading for this course is pass-fail. This course may be repeated up to four times for credit.

#### INDS 322: Technology Clinic

A small group of selected students work together with faculty mentors to solve a real-world problem proposed by an industrial or government sponsor, addressing the social, technological, and economic factors relevant to a solution. Students work on campus as a team and at times independently and on-site with the sponsors

#### PSYCH 234: Adult Development and Aging

Course description not offered for this course

#### Courses That Include Sustainability:

##### AMS 254: Cultures of Nature

This course is an interdisciplinary examination into the American relationship with nature. We will investigate how Americans have historically defined and currently conceive of concepts such as "nature," "wilderness," "environmental," and "green." The course will contrast and combine arts/humanities and scientific/technology perspectives, and it will merge active field-experience and field trips with the main topics and texts under discussion. Our texts will include diverse nature and environmental writings, films and visual culture, plus local physical landscapes and ecosystems. We will hike, paddle and camp, integrating site visits and activities in the Delaware River watershed with our critical explorations, so that the personal connection to place that is central to environmental literature, art, and science becomes an essential context for our understanding.

##### BIOL 235: Evolutionary Biology

An introduction to the principles of organic and molecular evolution. Topics include: genetic variation, natural selection, speciation, adaptation, diversification, biogeography, molecular evolution, and the mechanisms underlying each. Laboratory includes experimentation, computer simulation, and relevant reading/presentation of current primary literature in the field

##### CHE 413: Reaction Kinetics

The kinetics of reacting systems and the design of chemical reactors. Analysis of rate data; multistep reaction mechanisms, enzymatic reactions, catalysis and heterogeneous processes; design of single phase isothermal reactors, multiple-phase reactors, non-isothermal reactors, and nonideal reactors.

### CHEM 431: Inorganic Chemistry II

This course uses molecular orbital theory to explain the electronic structure and reactivity of inorganic complexes. Topics include symmetry and its applications to bonding and spectroscopy, electronic spectroscopy of transition-metal complexes, mechanisms of substitution and redox processes, organometallic and multinuclear NMR.

### ECON 255: Multinational Business and Corporate Social Responsibility

Strategic corporate social responsibility (CSR) is about how a company resolves the dilemmas around its core product or service, how that product is produced, and how and to whom it is marketed. In effect, multi-national corporations which have a business model that uses profit to fuel constant innovation in new products, now have to include, for example, programs to reduce emissions, carbon trading, fair trade practices and differential pricing of general drugs in poor developing countries that demonstrate the potential for CSR; others illustrate the continuing limitations. The object of this course is to make students aware of international business situations that require moral reflection, judgement and decision, while revealing the complexities that often surround business choices and the formation of public policies. Learning through cases of irresponsible actions as well as responsible behavior, the course focuses attention on the study of International Business circumstances in which hard choices must be made under complex conditions of uncertainty and disagreement. Students who receive credit for 255 may not receive credit for 352. Similarly, students who receive credit for 352 may not receive credit for 255.

### EGRS 251: Introduction to Engineering and Public Policy

This course introduces students to the governance of science and engineering. Course topics include the overall context for science and engineering policy, the public policy process and institutions involved in that process, and several current science and engineering public policy issues. The course includes a combination of role-playing exercises, debates, and field trips, as well as traditional lectures.

### ES 231: Nature of Materials

Nature and properties of metals, ceramics, polymers, and other materials in engineering applications. Interpretation of the mechanical, physical, and chemical properties from the viewpoint of scientific disciplines.

### FYS 038: Animal Voices

Are human beings the only animals capable of language? That birds and beasts can talk is usually regarded as an artifact of myths, fiction, and fantasy. However, recent findings complicate previously accepted distinctions between human and nonhuman behavior and abilities. This course will consider both scientific and imaginative perspectives on "animal voices." Our readings will come from various disciplines and genres, including animal behavior, linguistics, ethics, medieval fables, graphic novels, and film.

### GEOL 100: From Ice to Fire

A broad introduction to the geological processes acting within the earth and on its surface that produce volcanoes, earthquakes, mountain belts, mineral deposits, and ocean basins. The course considers the dramatic effects of plate tectonics, as well as the enormous periods of time over which geologic processes take place, also familiar features of the landscape formed by landslides, rivers, groundwater, and glaciers. Practical aspects are learned through discovery-oriented laboratory exercises, which include several field excursions.

### REL 102: Contemporary Religious Issues

An exploration of how religious people and ideas shape contemporary life. The course examines religiously-influenced issues such as the separation of church and state, the role of religion in violence and terrorism, and debates between religion and science. The course also looks at positive roles of religion and spirituality in modern culture.

### REL 240: Theories of Religion

What is religion? What is the nature of religious belief? What roles does religion play in society? How can we study and understand religion? There have been many attempts to answer these questions from sociology, anthropology, philosophy, psychology, comparative religion, and the feminist critique of religion. This course examines representative theories of the nature and study of religion, paying close attention to the contexts within which these theories arise, and how effective they are in leading to an understanding of religious beliefs and practices

### WGS 353: Single Motherhood

This course examines the cultural ideologies, institutions, and public policies that affect single women's experience of motherhood, with particular attention to the challenges faced by teenage and low-income single mothers. This is a community-based learning and research seminar; outside of class time, students will interact regularly with local teen moms, families living in transitional housing shelters, and/or non-profit agencies that support these women and their children-then engage in collaborative research or activist projects designed to support these members of the Easton community.