

## ENVIRONMENTAL STUDIES CONCENTRATION

### OVERVIEW

The Environmental Studies (ENVSTD) concentration fulfills one of Soka University of America's founding principles: to "foster leaders for the creative coexistence of nature and humanity." The complex problem of how humans can sustainably live on the planet requires a broad, multidisciplinary approach, one that a liberal arts background is well suited to deliver. Our concentration will provide students a foundation in the scientific understanding of human/environment relations, as well as an understanding of the philosophical, social, economic and organizational forces that shape those relations.

Students concentrating in Environmental Studies will have an opportunity to integrate both scientific and environmental management approaches to studying the environment. They will be prepared to address the full range of environmental issues – scientific, political, social, and cultural – through a coherent study of environmental problems and solutions. To achieve this breadth, students may take appropriate courses from other concentrations that have been cross-listed with ENVSTD. Students who select Environmental Studies will be able to fulfill their concentration requirements by focusing on one discipline (such as environmental science or policy), or through taking a variety of courses from the many disciplines within Environmental Studies. To fulfill the concentration requirements, students must take five concentration courses, three of which must be at the 300 or 400 level.

Our goal is to present students with a positive learning environment that encourages the creative, responsible, interdisciplinary and independent thinking necessary for understanding and effectively responding to local, regional, and global environmental challenges. The ENVSTD concentration at SUA can be an effective preparation for graduate school and environmental careers in government, advocacy organizations, and in business. With further preparation, students may progress to careers in environmental law, medicine, and economics, as well as environmental research, urban and regional planning, and resource management.

Students in the Environmental Studies concentration will learn to:

1. Demonstrate and articulate an understanding of, and critically evaluate environmental studies approaches to viewing interactions between humans and the natural environment, including scientific and environmental design perspectives as well as those of social and organizational studies.
2. Formulate original questions and apply theoretical and methodological tools to critically investigate and explain the biological, geological, chemical, social, and organizational processes that support and affect human and other life on Earth.
3. Communicate effectively their understanding of and prescriptions for human-environment interaction developed through application of the interdisciplinary approaches of environmental studies.
4. Engage with emerging environmental challenges and opportunities and be prepared to act professionally and personally to secure a sustainable future for humanity.

### CAPSTONE EXPERIENCE

#### CAPSTONE 390

**1 unit**

This is a 1 unit P/NP course where students will select and work with a faculty mentor to complete a proposal for the capstone research project.

#### CAPSTONE 400 Capstone I

**4 units**

All SUA students participate in a capstone research project over the last block and semester of their senior year. This research project is intended to be a culminating experience, drawing upon the skills and expertise that they have developed during their career at SUA. Each student works with a faculty mentor to propose, develop, and carry out a research project. Students meet regularly with their capstone mentor for support and feedback. *Prerequisite: Senior standing. CAPSTONE 390. Instructor Consent Required. This course cannot be taken on a P/NP basis.*

#### CAPSTONE 450 Capstone II

**4 units**

Continues Capstone I. *Prerequisite: CAPSTONE 390 and CAPSTONE 400. Instructor Consent Required. Prerequisite: senior standing. This course cannot be taken on a P/NP basis.*

## ENVIRONMENTAL STUDIES

## COURSE DESCRIPTIONS

**Ecology****ECOL 211 Sustainable****Aquaculture****3 units**

This class will provide you with an introduction to the science of aquaculture: historically known as fish farming. Although we will be spending the majority of time talking about fishes, aquaculture also includes the farming of invertebrates, as well as plants. During the semester, we will be discussing all aspects of aquaculture including economics, diseases, nutritional requirements, and rearing techniques for various aquatic species.

**ECOL 222 Wildlife Conservation and Management****4 units**

This course examines ecological principles used to conserve and manage wildlife resources at the individual, population, and community levels. Topics include conservation biology and genetics, species interactions, animal-habitat relationships, population dynamics, habitat management, and habitat restoration.

**ECOL 330 Fish Biology****4 units**

An introduction to species diversity, natural history, and ecological and evolutionary relationships of fishes. Emphasis on form and function, ecology, behavior, sensory modes, fishery management, global crises in fisheries, and marine protected areas. Laboratories include identification of major groups of fishes, methodology and experimental approaches to the study of fishes. *Prerequisite: Any BIO, ECOL, EOS, or CHEM course, or consent of instructor.*

**ECOL 360 Environmental****Microbiology****4 units**

The rainforest may be called “the lungs of the planet,” but the job of regulating the atmosphere and the water falls largely to microscopic organisms. Deep in the ocean or under the soil, they continue their strange and alien forms of metabolism, a two-billion-year-old legacy from the days before plants transformed the Earth’s atmosphere. In this field- and laboratory-based course, students will explore the world of microbes in the environment through structured approaches to fundamental concepts, as well as through observation and experimentation.

**ECOL 370 Terrestrial Plant Ecology****4 units**

Terrestrial plants have been present on this planet for 440 million years and play a critical role as the basis of the terrestrial food chain. This course introduces students to the diversity of plant life and how plants have evolved and adapted to their respective environments. Topics include plant structure and growth, species interaction, community ecology, and succession.

**ECOL 402 Aquatic Conservation****3 units**

This course examines the problem of maintaining biological diversity in a human dominated world within the aquatic ecosystems. Emphasis is on the biological concepts involved in population biology, genetics and community ecology, and their use in conservation and management of biodiversity. We will investigate the impacts of human-induced climate change, pollution, introduction of exotic species, over fishing, and endangered species conservation. *Prerequisite: Any BIO, ECOL, EOS, or CHEM course, or consent of instructor.*

**ECOL 435 Alien Invaders****3 units**

This course is designed to provide students with perspective on the impacts of exotic species, those organisms that are not native to a geographical area, primarily within Southern California but will also cover major invasions in the USA. The ecological, genetic, and evolutionary impacts of the invasions will be explored. Additionally, the management and control of exotic species will be discussed. *Prerequisite: Any BIO, ECOL, EOS, or CHEM course, or consent of instructor.*

**Environmental Management and Policy****EMP 248 Environmental Design****3 units**

Environmental design takes the natural environment into account in all aspects of industrial and urban development and policy. Environmental design is integrated into the natural environment because it is designed both to utilize and respond to natural, renewable sources of energy and materials. This integration makes it both more efficient and less disruptive to the natural environment. In this course, students will explore environmental design through readings, discussions, and team problem-solving exercises, focusing on real-world design problems of current interest.

**EMP 300 Sustainable California 3 units**

This course is a practice- and practitioner-oriented course that advances students' understanding of the specific settings and organizations involved in sustainability planning and practice across (mainly Southern) California. A series of local field trips and guest speakers expose students to the wide range of stakeholders involved in promoting environmental planning and policy efforts across the state, showcasing local sustainability plans as well as complex regional and state-wide planning challenges such as water conservation, reduced fossil fuel use, and future plans for high-speed rail.

**EMP 320 Environmental Planning and Practice 3 units**

This course covers the fundamentals of environmental planning and practice, including water supply, air quality, waste treatment, recycling, the protection of farmland, open spaces, wetlands and sensitive coastal habitats as well as best practices in transportation, energy, urban planning and design. How does land use planning work? Who plans? Why, when and how are environmental impact assessments and environmental reviews performed and by whom? How do public authorities, planners, developers, and concerned citizens negotiate intricate land use conflicts, especially in the case of major new infrastructures such as rail corridors, freeways, (air)port expansions or larger, master planned communities?

**EMP 330 Sustainable Cities 3 units**

More than half of the world's 7 billion people live in cities. Urban societies need to find ways to reduce their negative environmental impacts on the Earth's eco-system. This course focuses on the analysis of urban development patterns in North America and Europe. Students will learn how to create and plan for human settlements that are less carbon-intensive, more ecologically responsible, and more socially sound. Via a variety of case studies, students will be introduced to sustainability concepts such as ecological urbanism, green building certification (LEED), smart growth, transit-oriented development and suburban retrofitting.

**EMP 335 Cities and the Environment in the Global South 3 units**

Between 2000 and 2030, the urban populations of the developing regions in the Global South will double from 2 to 4 billion people, accounting for the vast majority of urban growth on this planet. Taking a comparative view of urbanization and development, this course focuses on a select number of mega-cities in the Global South where millions of urban dwellers lack adequate shelter and access to clean water, sanitation and other basic infrastructure. What are the causes and environmental consequences of rapid urbanization and urban expansion in cities as diverse as Rio de Janeiro, Nairobi, Lagos, Mumbai or Chongqing? What strategies, programs and policies exist that can steer future urban development in a more environmentally sustainable direction?

**EMP 340 Environmental Movements 3 units**

This course examines the role of environmental movements in the development of policies for environmental protection and on the role of nongovernmental organizations in environmental politics and policy more generally.

**EMP 350 Environmental Policy 3 units**

Environmental policies are social actions designed to protect the environment. This course examines the processes and consequences of policies for environmental protection. This course also examines the roles of leadership, laws, and organizations in environmental protection.

**EMP 380 Environmental Law 3 units**

This course provides a general introduction to the role of laws and legal processes in environmental protection.

**EMP 400 Environmental Management 3 units**

This course focuses on case studies of the development and management of policies for environmental protection. These case studies allow a detailed examination of the practical challenges facing environmental managers and leaders today, and an examination of the possibilities for new approaches to environmental management and policy in the future.

## ENVIRONMENTAL STUDIES

**EMP 410 International and Comparative Environmental Policy** 3 units

This course examines the processes and consequences of policies for environmental protection in an international and comparative context. The course focuses on the role of institutional processes, government organizations, and nongovernmental organizations in environmental politics and policy across the world.

**EMP 430 Urban Planning and the Built Environment** 3 units

A full and deep understanding of our complex relationships with the natural environment also requires sophisticated and advanced knowledge of the different and specific ways in which our human settlements evolved over the course of history. This course provides a critical introduction to the interdisciplinary world of urban planning. Most of the cities, towns or neighborhoods we encounter did not simply “happen” – they were formally founded and planned by someone. Many of the world’s most famous cities were carefully laid out in relationship to their natural surroundings. And even haphazardly placed self-built homes still require access to public infrastructures and social institutions such as water, sewer and power lines, roads, schools or hospitals. We will start off learning about the history and theory of planning as it was and is practiced in the United States but we will then soon expand our perspective to look at urban planning and built environment issues through a global lens. Which cities were or are global leaders in the world of city building and urban design? What are the most important issues and topics for planning practitioners right now? What do planners do when they “plan”? How do we justify planning? How do we define the public interest the profession purports to serve? What are the key conflicts and ethical dilemmas? How does the global threat of climate change and sea level rise change the way we plan and manage cities? *Instructor Consent Required.*

**Earth and Ocean Sciences****EOS 280 Sustainable Agriculture and Gardening** 3 units

Although humans can obtain the air and (and to a lesser extent) the water they need freely, we must work to provide our bodies with food. Before the

industrial era, hunting, gathering, and farming were the primary human activities. Technology and industrialization have greatly reduced the human labor required to produce food, and farming has become the specialized occupation of the few. However, in the process, modern industrialized agriculture has developed into a system with many negative externalities (costs not accounted for in the price of food), such as water pollution, greenhouse gas production, and the health consequences of highly processed diets. These high costs of industrialized agriculture make it unsuitable to meet global human needs as population increases, water resources become scarce, and global warming makes the intensive use of fossil fuels undesirable. In this course, we will examine what a more sustainable mode of food production might look like through class work as well as hands-on work in the Soka Instructional Garden.

**EOS 302 Introduction to Climate Change** 3 units

The Earth’s climate is changing because human activity is increasing the levels of greenhouse gases such as carbon dioxide and methane in the atmosphere. You will learn what causes climate change, as well as its present and future effects on both the Earth and society. You will also learn about the responses society and individuals can make to prevent and adapt to climate change. In the laboratory portion of this class, you will learn how to plan and perform a scientific experiment measuring greenhouse gases.

**EOS 322 Water Resources** 4 units

The struggle to manage water resources has shaped societies in the past and continues to do so today. Human use of water for drinking, sanitation, and agriculture is controlled by natural processes, by engineering, and by the institutions that manage water for the benefit of societies. In this course students will study how these processes control the availability and quality of water. Students will explore water resources in the local area through field visits to both natural and engineered sites and will learn to apply some of the techniques of water resource managers.

**EOS 446 Biogeochemistry** 3 units

Biogeochemistry is the study of the flows of the basic elements required for life through the

Earth's environmental systems. Biogeochemistry ties together processes occurring in the water, atmosphere, soils and in living organisms, tracing the transformation of essential elements from one form to another in their cyclic journeys on the Earth's surface. Students will use advanced laboratory and field techniques to study biogeochemical transformations in the environment, learn to read and interpret scientific literature, and write a scientific paper.

### Geography

#### **GEOG 110 Regional Geography of the Pacific Rim**

**3 units**

The Pacific Rim is characterized by a wide range of climate zones and physical landscapes that create unique environments, challenges, and opportunities for humans and wildlife. This course provides students with an introduction to geographic concepts and perspectives from both physical and human geography while exploring the five major regions along the Pacific Rim: North America, Central and South America, Australia and Oceania, East Asia, and Southeast Asia. Topics covered include the physical environment, environmental issues, human patterns over time, economic and political issues, and sociocultural issues.

#### **GEOG 250 Physical Geography**

**4 units**

Physical Geography is the science of our environment and how this environment provides opportunities and challenges for humans. The course will cover the three major subject areas: (1) atmosphere and weather, (2) biogeography, and (3) geology and landforms. The goal of this course is to develop a thorough knowledge, understanding, and appreciation of our Earth.

#### **GEOG 350 Introduction to Geographic Information Systems**

**4 units**

Geographic Information Systems (GIS) is a computer system for storing, managing, and displaying (mapping) the locations and attributes of spatial features. These features can come from any discipline and could represent people, towns, rivers, countries or any other human or physical information. Due to its versatility, GIS is used in a wide range of applications such as resource management, city planning, transportation, business, property management and crime hot spot analysis. This course will introduce students

to this powerful software through lectures in GIScience and hands-on labs with ArcGIS.

#### **GEOG 400 Advanced Geographic Information Systems**

**3 units**

This advanced course provides instruction in Geographic Information Science, ArcGIS, and Python. Course topics include projections, geometric transformations, attribute data management, cartography, vector and raster data analysis, terrain mapping, viewsheds, watersheds, spatial interpolation, geocoding, network analysis, and modeling. *Prerequisite: GEOG 350 or similar course.*

#### **GEOG 440 Biogeography**

**4 units**

Biogeography is the science of the distribution of plants and animals and the patterns and processes responsible for these distributions. This course introduces students to the discipline of biogeography and its major topics such as island biogeography, speciation and extinction, diversification, and conservation from a more geographical perspective emphasizing large scale patterns through space and time.

### Environmental Studies

#### **ENVST 170 Environmental Ethics**

**3 units**

This course considers the role ethics and philosophy play in how wo/man relates to her and his human and natural environment. The central themes of the course are the relationship between human centered and nature centered views of the universe and wo/man's responsibility for the care of the universe. Philosophies considered include but are not limited to Anthropocentrism, Confucianism, Taoism, Aristotelianism, Humanism, Transcendentalism, American Indian, EcoFeminism and Deep Ecology. *Same as: PHIL 170.*

#### **ENVST 215 Music and Ecology:**

##### **Studies in Interconnection**

**3 units**

This course will examine embedded views of the relationship between humans and their environments in the context and function of music in different times and cultures. Music is both commonly a means of the most profound communication between humans and nature, and embodies cultural understanding and expression of the relationship, humans place in nature. Readings will include examination of music

## ENVIRONMENTAL STUDIES

cultures, the expressed views and philosophies of the people in those music cultures, and studies of the ecological systems and ecological impacts of human actions where those people live. *Same as: MUSICHST215.*

### **ENVST 230 Thinking Through Nature** **3 units**

From Heraclitus on, the concept of nature has proven to be unique in its ability to expand imagination, stimulate thought, and articulate disagreement. This class will place major texts in the traditions of natural philosophy, pastoral, and cultural critique alongside contemporary interventions, including arguments for the ecology without nature. Our goal is to rethink nature in response to the technological mastery of all life made possible by the advancement of science. The texts to be studied include Aristotle, Pliny the Elder, Lucretius, Virgil, Rousseau, Diderot, Thoreau, Darwin, Dennett and Will Self. *Same as: LIT 230.*

### **ENVST 360 Environmental Economics** **3 units**

This upper division course combines theory and policy surveys to study environmental issues from an economist's perspective. Major topics include theoretical and applied modeling of the economy-environment relationship, causes and consequences of market failure affecting environmental services, the design and evaluation of environmental policy instruments, and the political economy of environmental policy. Students will learn to identify the economic components of an environmental issue, analyze the impacts of human economic activity on the environment, and present and discuss the pros and cons of various environmental policies. *Prerequisite: ECON 100 or INTS 100. Same as: ECON 360.*

### **ENVST 290 Topics in Environmental Studies** **1-4 units**

### **ENVST 390, 490 Advanced Topics in Environmental Studies** **1-4 units**

### **ENVST 298, 398, 498 Special Study** **1-4 units**

### **ENVST 299, 399, 499 Independent Study** **1-4 units**