

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE COURSE SYLLABUS

Course Title: INTRODUCTION TO ENVIRONMENTAL SCIENCE **Course #:** EVS* 100

Course Description: 3 semester hours (3 lecture hours): For non-science, education, AND science majors. This three credit, non-laboratory science course is designed to provide an overview of long-term effects on the well-being of the planet and its inhabitants. The course will examine ethics, attitudes and history; natural systems; population; global and regional environmental issues including: biodiversity loss, overconsumption of resources, food production and challenges, energy sources, pollution, waste, and urbanization; and economics, solutions, and attitudes, using current and historical topics as a lens to examine the complexities of these topics.

Pre-requisite/Co-requisite: Placement into ENG* 101

Goals: To provide students with a basic understanding of major environmental challenges facing modern societies and understand choices and trade-offs these challenges pose; to help students grasp scientific principles underlying basic phenomena of environmental change; to provide students with an understanding of technologies associated with major environmental problems and those that may help solve these problems; to assist students in distinguishing environmental impacts of industrial vs developing societies; to provide students with a basic understanding of different societies perceive environmental problems and pursue different solutions; to delineate how issues discussed in the course are connected to decisions and choices students make in their personal lives; to help students appreciate that complexities and intricacies of environmental problems demand a holistic approach, manifest by team work and group communication.

Outcomes (Lecture): At the end of the course, students should be able to:

- Define the term environment and identify some important environmental concerns we face today
- Compare and contrast how different ethical perspectives shape our view of nature and our role in it and describe how religious and cultural traditions, worldviews, and core values influence our perceptions of nature
- Summarize the methods, applications, and limitations of the scientific method.
- Summarize the major biogeochemical cycles, including the hydrologic cycle, and how each is balanced over time in the hydrosphere, lithosphere, and atmosphere.
- Describe the soil properties of porosity and permeability and characterize a soil sample.
- Describe how environmental factors determine which species live in a given ecosystem and where or how they live.
- Appreciate the potential of exponential growth and define fecundity, fertility, birth rates, life expectancy, death rates, and survivorship; compare and contrast density-dependent and density-independent population processes.
- Recognize characteristics of major aquatic and terrestrial biomes, identify important factors that determine the distribution of each type, and describe ways in which humans disrupt or damage each of these ecosystem types.
- Diagram and categorize the relationships between organisms of various trophic levels within a community and explain the functions of each aspect of a food web.
- Trace the history of human population growth, discuss the environmental and social impacts of human population growth, and explain the process of demographic transition.
- Identify human contributions to global climate change and what effects modifications have on physical and biological systems.

- Summarize benefits humans derive from biodiversity and identify sources of biodiversity loss in the modern world.
- Identify land use practices, problems, and policy.
- Interpret and assess the effects of land use practices on the porosity, permeability, and erosivity of the soil.
- Recognize the origins and current problems of national parks in America and other countries.
- Analyze the various strategies being utilized to conserve biodiversity and ecosystems.
- Identify some major infectious organisms and hazardous agents that cause environmental diseases and examples of emergent human and ecological diseases.
- Distinguish between toxic and hazardous chemicals, including pesticides, and between chronic and acute exposures and responses.
- Differentiate between famine and chronic undernutrition and understand the relation between natural disasters and social or economic forces in triggering food shortages.
- Describe the pros and cons of various food sources and identify the life cycle of major food crops in modern society.
- Predict, using systems thinking, agricultural challenges that might result from climate change.
- Make recommendations for sustainable agricultural practices in a hypothetical scenario.
- Identify ways to reduce the ecological footprint of food and evaluate the movements of localism and organic as effective strategies in sustainable food systems.
- Summarize our current supply and needs, including the costs/benefits of all conventional energy sources, and explain briefly how energy use has changed through history.
- Appreciate the opportunities for energy conservation and renewable energy sources available to us.
- Describe the major categories and sources of air pollution, judge how air quality around the world has improved or degraded in recent years, and suggest what we might do about problem areas.
- Appreciate the causes and consequences of water shortages around the world, what they mean in people's lives in water-poor countries, and what the future projections for water shortages entail.
- Analyze personal water consumption and evaluate water-saving strategies.
- Define water pollution, including sources and effects of some major types, judge impacts of water pollution legislation, and differentiate between best available/best practical technology and total maximum daily pollution loads.
- Identify the major components of the waste stream, including toxic and hazardous wastes, and describe how wastes have been - and are being - disposed of in North America and around the world.
- Analyze personal trash production and identify strategies to reduce solid and hazardous waste.
- Explain how resource supply and demand affect price and technological progress.
- Define ecological economics and identify its basic tenants.
- Recognize opportunities for making a difference through goods and services, as well as limits of green consumerism.
- Identify 'greenwashing' practices within companies, governments, and non-governmental organizations.
- Appreciate the importance of wicked problems, resilience, and adaptive management in environmental planning.
- Evaluate how green politics and environmental citizenship can help protect the earth.
- Evaluate the major environmental risks we face and how risk assessment and risk acceptability are determined.
- Formulate their own philosophy and action plan for what they can and should do to create a better world and a sustainable environment

Evaluation:

Mastery of outcomes will be evaluated through a mix of projects, writing assignments, discussions, check-ins, and quests. Please see the Grading Criteria below for details.