

*ABET Course Syllabus***Course Information, Textbook and Supplementary Materials**

Course Description: Basic concepts of environmental engineering. Current and classic environmental issues will be used to develop critical thinking skills and form opinions on local, regional, and global environmental issues. This course will start with environmental philosophy and continue with scientific principles and case studies. Technological, social, and economic concerns will be considered. Air, water, and soil pollution control technologies; pollution prevention strategies. Design of simple water distribution and treatment systems.

Required for: BSCE Environmental; and BSENE degree programs

Prerequisites and Co-requisites: None

Required Textbook:

- *Taking Sides*, 16th edition by Thomas Easton, McGraw-Hill Education, 2014

Reference:

Hammer, M. J., and Hammer, M.J., Jr., *Water and Wastewater Technology*, Pearson Prentice Hall, 2006

| Topics Covered | Learning Outcomes |
|---|---|
| Environmental problems, their causes, and sustainability | Students will know and understand the following: 1. The root causes of environmental problems; principal types of pollution and how they can be reduced or prevented; natural resources (renewable, nonrenewable, and perpetual) and sustainability; and living more sustainably. |
| Science, matter and energy; ecosystem approach to sustaining biodiversity | 2. The law of conservation of matter and types of energy; first and second laws of thermodynamics and their applications to the environment; matter recycling and reuse economies; and how to live more sustainably |
| Air pollution, global warming and ozone loss | 3. Energy and matter in ecosystems; Biogeochemical cycles (carbon, water, nitrogen, phosphorus, and sulfur); Food chain, food web and diversity of organisms; and Effects of human activities on biomes (terrestrial and aquatic) |
| Air pollution, climate change, global warming, and ozone loss | 4. Photochemical smog and air pollution; Harmful effects of air pollutants on humans, plants, buildings, etc.; Air pollution prevention and control strategies (particulate matter and gaseous pollutants), Global warming, its causes, and strategies to reduce it; and Ozone hole and strategies to prevent it. |
| Water resources and water pollution | 5. World's freshwater supplies and associated problems; Water pollution problems in rivers, lakes, oceans and groundwater; Treatment of surface water containing turbidity; Treatment of domestic wastewater; and Prevention and reduction of water pollution. |

| | |
|--|---|
| Hydraulics of water and wastewater transport systems; Drinking water treatment plant [simple] design | 6. Fundamental hydraulic design of pipes; Design of a pre-sedimentation tank; Design of rapid-mix tank for chemical addition; Design of flocculation tank; Design of sedimentation tank; and Design of chlorination tank. |
|--|---|

CE 110 **Introduction to Environmental Engineering** **3 Units**
 USC | SONNY ASTANI DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

| Lecture and Lab Schedule | | | |
|--------------------------|----------------------|-------------------|----------------------|
| Lecture | | Lab | |
| Sessions per Week | Duration per Session | Sessions per Week | Duration per Session |
| 2 | 1.5 hours | n/a | |

| <p>Relation of Course Objectives to Program Outcomes</p> <p>The Civil Engineering program is designed to teach beyond the technical content of the curriculum and prepare the students to utilize what they learn in a professional setting.</p> <p>This course contributes to the program outcomes as outlined in the adjacent table.</p> | Course Contribution to Program Outcomes (a-k) | ✓ Key |
|---|---|----------|
| | c. An ability to design a system component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. | |
| | f. An understanding of professional and ethical responsibility. | ✓ |
| | g. An ability to communicate effectively. | ✓ |
| | h. The broad education necessary to understand the impact of engineering solutions in a global economic and environmental and societal context. | ✓ |
| | i. Recognition of the need for, and an ability to engage in life-long learning. | ✓ |
| | j. Knowledge of contemporary issues. | ✓ |

Course Coordinator: Dr. Amy Childress
 Professor of Environmental Engineering

Date: Fall 2014