ENE 201
Introduction to Applied Environmental Science and Technology
Spring 2007

Goals:
This course is intended to teach students the fundamental concepts in environmental science and engineering dealing with water, air, and land pollution, and other areas such as ecology, toxicology, population growth, global warming, ozone depletion, environmental regulations, mineral resources and energy resources.

Cooperative Learning Strategy:
During the class, we will be practicing important concepts of skills of cooperative learning in small working groups of two students. This strategy is designed to increase your mastery of the course content. You will be expected to actively participate in an effort to ensure your own and your teammates’ understanding of the ideas presented in the class. We need your commitment to demonstrate a willingness to contribute ideas, to listen to others, and to be a constructive force in the learning process.

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Office hours: Monday, Tuesday, and Thursday: 11:00 AM to 1:00 PM; and also by appointment.

Class hours: Monday and Wednesday 4:00 to 5:40 PM and 5:20 to 6:10 PM, KAP 141
Internet: http://www.usc.edu/dept/civil-eng/dept/ene201

Grading Criteria:
Midterm Exams (two) 15% each
Final Exam 25%
Quizzes 15%
Reports 10%
Term Project 15%
Class Participation 5%

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Total 100%
EN 201: Exam & Quiz Schedule

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<tr>
<th>Item</th>
<th>Date</th>
<th>Information</th>
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<tbody>
<tr>
<td>Quiz 1</td>
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<td>Chapters 1, 2, &amp; 3; Unit 4</td>
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<tr>
<td>Midterm 1</td>
<td></td>
<td>Chapters 1, 2, 3, 5 &amp; 6; Unit 5</td>
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<td>Quiz 2</td>
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<td>Chapters 8 &amp; 11(part 1); Units 4, and 5</td>
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<td>Midterm 2</td>
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<td>Chapters 8, 11(parts 1 and 2) &amp; 13; Unit 10</td>
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<td>Final Exam</td>
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<td>All above chapters (plus 15 &amp; 16)) and units, class notes, reports and homework</td>
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**Term Project:**

Please see the term project information page.

**Reports:**

Three reports of two to three pages (double-spaced) are required for the semester. Reports will be written for the following videos:

1. The Estrogen Effect
2. Toxic Trials
3. Global Dumping Ground

**Textbook:**


**Study Guide:**

Instruction for the Term Paper Preparation and Presentation

Students in groups of two will be required to submit a term paper. The term project will constitute 15% of the semester grade. A list of suggested topics is provided at the end of this handout, or you may suggest your own topic. Students are required to submit a choice of topic, a printout of your computer search, a rough draft, and the final paper. Deadlines for these submittals are:

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<tr>
<th>ITEM</th>
<th>DUE DATE (Due at the Beginning of class period)</th>
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<tbody>
<tr>
<td>Choice of Topic</td>
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<td>Computer Search Printout</td>
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<td>Rough Draft</td>
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<td>Final Paper</td>
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**Term Paper Presentation:**

A 12-15 minute presentation on the term paper topic is required. Student presentations will be made in class on April 25, 2007. A sign-up sheet will be passed around in class on Wednesday, April 18, 2007.
SUGGESTED TOPICS FOR TERM PROJECT

1. Radioactive Waste
2. Ocean Pollution
3. Atmospheric Pollution
4. Water Treatment
5. Global Warming
6. Human Impact Upon National Parks
7. Modern Landfills
8. Sequestering Carbon Dioxide from Industrial Plants
9. Life and Death of a Coral Reef
10. Rain Forests
11. Lake Eutrophication
12. Ozone Depletion
13. Trihalomethane Formation and Removal
14. Fossil Fuels and Environmental Degradation
15. Soil Pollution
16. Water Reclamation and Reuse
17. Materials Recycling
18. Pollution Prevention
19. Deforestation
20. Harnessing Power from Ocean
21. Groundwater Contamination
22. Hexavalent Chromium in Groundwater

Note: Please consult your instructor should you be interested in other related topics.
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Course Syllabus

Environmental Problems, Their Causes, and Sustainability (1/2 week)
- Living more sustainably
- Population Growth, Economic Growth, Economic Development
- Environmental Problems: Causes and Connections
- Is Our Present Course Sustainable?

Science, Systems, Matter and Energy (2 weeks)
- Science, Technology, and Environmental Science
- Models and Behavior Systems
- Matter and Energy: Fundamental Concepts
- Law of Conservation of Matter
- Fundamental Laws of Energy
- Nuclear Changes
- Biogeochemical Cycles

Climate and Biodiversity (1 week)
- Climate and Factors Affecting It
- Climate and Life on Land
- Aquatic Environments
- * Saltwater Life Zones (Estuaries, Coastal Wetlands, and Mangrove Swamps)
- * Freshwater Life Zones (Lakes, Streams, Freshwater Wetlands)

Sustaining Biodiversity: The Ecosystem Approach (1/2 week)
- Human Impact on Biodiversity
- Forest Resources and Management in the U.S.
- National Parks
- Ecological Restoration
- Sustaining Aquatic Biodiversity

Energy (1 week)
- Evaluation of Energy Resources
- Nonrenewable Fossil Fuels (oil, natural gas, oil sand and oil shale, and coal)
- Nonrenewable Nuclear Energy
- Improving Energy Efficiency
- Geothermal Energy
- Sustainable Energy Strategy
Air Pollution (1 week)
- Structure and Science of Atmosphere
- Outdoor Air Pollution
- Photochemical and Industrial smog
- Indoor Air Pollution
- Harmful Effects of Air Pollution
- Preventing and Reducing Air Pollution
- Air Pollution Control Technologies

Climate, Global Warming, and Ozone Loss (1 ½ weeks)
- Past Climate Change and the Natural Greenhouse Effect
- Climate Change and Human Activities
- Factors Affecting the Earth’s Temperature
- Dealing with the Threat of Global Warming
- Ozone depletion in the Stratosphere
- Protecting the Ozone Layer

Water Resources and Water Pollution (3 ½ weeks)
- Importance and Unique Properties of Water
- Supply, Renewal, and Use of Water Resources
- Problems Relating to Water Resources and Possible Solutions
- Pollution of Streams, Lakes, and Groundwater
- Marine Pollution
- Drinking Water Treatment
- Wastewater Treatment

Minerals and Soil (1 ½ weeks)
- Geologic Processes and Cycles Relating to Rocks and Minerals
- Environmental Impacts of Utilizing Mineral Resources
- Soil Characteristics and Importance
- Soil Erosion and Soil Conservation Concepts

Solid and Hazardous Waste (1/2 week)
- Reducing, Recycling and Reusing Solid Wastes
- Burning and Burying Solid Wastes
- Hazardous Wastes: Types and Production
- Solutions to Hazardous Waste Problems
- Hazardous Waste Regulations in the United States