

**ENVIRONMENTAL CHEMISTRY
CHEMISTRY 1010**

COMMON COURSE OUTLINE

(H:\CH\Com Course Outlines\comn course 1010 s06.doc)

Chemistry 1010

January 2007

Catalog Description:

Chem 1010 - Environmental Chemistry - 4 credits - Offered Fall and Spring Semesters. Lecture three hours, lab two hours. Chemical concepts are covered and applied to understanding and analyzing current environmental issues.

Topics include air and water pollution, nuclear power, energy usage and recycling.

Prerequisites:

None

Outline of Major Content Areas:

1. Air quality and air pollution
2. The ozone layer and CFCs (chlorofluorocarbons)
3. The chemistry of global warming
4. Energy and chemistry- focus on fossil fuels
5. Water quality and pollution
6. Acid rain
7. Nuclear fission and nuclear power plants
8. Alternate energy sources - solar, hydroelectric, wind, geothermal
9. Plastics and polymers
10. Agricultural chemistry
11. Nutrition and healthy living
12. Home environmental hazards
13. Land Pollution and Recycling

Requirements:

Reading assignments, questions and problems from the textbook:

Chemistry for Changing Times; 10th Edition by Hill & Kolb (Fall semester)

Chemistry in Context 3rd Ed. American Chemical Society (Spring semester).

Completion of all assigned laboratory experiments.

Course Objectives and Learning Outcomes:

1. The student will develop an understanding of some basic principles of chemistry and apply these principles to current environmental issues. (Goal Three, Natural Sciences, Competency a. Goal Ten, People and the Environment, Competency d.)
2. The student will assess the risks and benefits of environmental problems from social, economic, and political points of view. (Goal Two, Critical Thinking, Competency c. Goal Three, Natural Sciences, Competencies a, d. Goal Ten, People and the Environment, Competencies d, e.)
3. The student will develop an understanding of how chemists approach and attempt to solve environmental problems. (Goal Two, Critical Thinking, Competency a. Goal Three, Natural Sciences, Competencies a, d. Goal Ten, People and the Environment, Competency e.)
4. The student will further develop his/her own point of view regarding the role of chemistry and technology in our society. (Goal Three, Natural Sciences, Competencies a, d. Goal 10, People and the Environment, Competencies e, f.)
5. Students will learn to think analytically and assess information in such ways to make informed conclusions and decisions about controversial environmental issues. (Goal Two, Critical Thinking, Competencies d.)
6. The student will perform some of the laboratory operations that are used by chemists in approaching and solving environmental problems. (Goal Three, Natural Sciences, Competencies b, c, d. Goal Ten, People and the Environment, Competency e.)

Experiments:

Pollution

1. Safety
2. Metric
3. Qualitative analysis and Food Dyes
Chromatography

10. Air

11. Water Analysis
12. Water Treatment
13. Household Chemicals

4. Chemical, Physical, and Nuclear Processes
5. Name and Classify Chemicals
6. Antacid Titration problems
7. Chemical Nomenclature experiments (13 lab sessions)
8. Polymers and Esters paper for extra credit
9. Oxidation-Reduction final exam

Methods of Evaluation:

Three hour exams
Homework

Laboratory

Special projects or

Comprehensive

Grades:

A - 90% B - 80% C - 70% D - 55%

Assessment:

During the semester a number of assessments will be performed in order to monitor students' progress, provide students with feedback, and to identify areas that require additional