

**Course Description:**

Chemistry of water, gas, liquid and solid wastes. Chemical principles applicable to environmental engineering.

**Design Kernel for:** BSCE-ENE    **Elective for:** BSENE

**Prerequisite:**

CHEM 105*bL* General Chemistry, or  
 CHEM 115*bL* *Advanced General Chemistry*

**Prerequisites by topic:**

- general chemistry and problem solving
- organic chemistry and nomenclature system of compounds
- analytical chemistry and instrumental analysis
- introductory principles of physical chemistry
- inorganic chemistry
- colloid chemistry
- basic information in elementary biochemistry and geochemistry

**Required Textbook:**

T. F. Yen, *Environmental Chemistry: Chemistry of Major Environmental Cycles*, Imperial College Press, 2005.

**Reference:** Required notes: CE/ENE 443 - USC publication (Bookstore)

Topics Covered	Learning Outcomes
Students will understand the following topics:	
Basic chemistry of earth, air and water; and describing the changes resulting from pollutant discharges; and presenting the chemical perspective of environmental problems.	1. Review basic chemistry
	2. Lithosphere and chemistry; energy: fossil fuels, solar, geothermal, nuclear powers, etc.
	3. Atmosphere chemistry
	4. Hydrosphere chemistry

5. Biosphere chemistry, including pedosphere chemistry

**CE 443**  
 **ENE**

**Environmental Chemistry**

**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
1	3 hours	n/a	

**Relation of Course Objectives to Program Outcomes**

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.

This course contributes to the program outcomes as outlined in the adjacent table.

Course Contribution to Program Outcomes (a-k)	✓ Key
a. An ability to apply knowledge of mathematics, science, and engineering.	
d. An ability to function on multidisciplinary teams.	
e. An ability to identify, formulate and solve engineering problems.	
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.	
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	

**Prepared by:** Dr. Massoud Pirbazari  
 Professor of Environmental Engineering

**Review Date:** Fall 2014