

## CHEMISTRY 560 - ADVANCED ENVIRONMENTAL CHEMISTRY

### Southern Connecticut State University

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R 11:00 - 12:00

### Fall Semester 2006

**Text:** *Environmental Chemistry, A Global Perspective, 2<sup>nd</sup> ed*; Gary W. vanLoon and Stephen J. Duffy, Oxford University Press (2005)

**Course Overview:** Chemistry 560, Environmental Chemistry, is the study of natural and anthropogenic substances in the environment. Specifically, the course will cover the source, transport, reactions, effects and fate of chemicals in the atmosphere, hydrosphere and lithosphere. The course will also examine the interaction of these three areas for chemical substances.

### Final Course Evaluation:

Graded Homework	25%
Mid-Term	25%
Paper	25%
Final Exam (cumulative)	25%
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	100%

There will be at least four homework assignments during the semester. Homework is due at the beginning of the class period following the completion of the material in lecture.

A paper written on any aspect of environmental chemistry is required for this course. The paper is to be 5 - 8 pages in length including footnotes and bibliography and must be typed. A minimum of three primary references must be used. The topic of the paper is chosen by the student but must be approved by the instructor no later than the fourth meeting of the class. All papers are due no later than class time on the last day of class. The subject matter of the paper must discuss the chemistry of the topic. Some suggestions for the paper are listed below, but feel free to choose your own topic. No two students may write on the same topic.

Formation of Secondary Aerosols in the Atmosphere  
Decomposition Products of (pesticides, PAHs, etc.) in (soils, water).  
Aerobic (and/or) Anaerobic Decomposition of Biomass  
Photolysis reactions of (OM, PAH, Terpenes) in the Environment  
The Environmental Chemistry of (PAH, heavy metals, Cu) in (air, water, soil)  
Microbiologically Mediated Reactions in Aquatic Systems  
Artifact Formation in Air Sampling  
Sources of contamination (and/or) spurious reactions during aquatic sampling

The Role of Colloids in Environmental Chemistry  
Metal Speciation in Aquatic Systems  
Aerobic/Anaerobic bioremediation of (PAH, HC, PCB, OM)

**Late/Missed Work:** Generally, there will be no make-up examinations. In the event of illness or other catastrophic events, written evidence (doctor's note, etc.) must be supplied. The professor MUST be notified before the scheduled exam if a make-up is to be considered. There will be no lectures on exam days.

**Attendance:** Regular and prompt attendance of scheduled classes is expected. Some of the material covered in lecture will be additional to what is covered in the text book.

**Inclement Weather:** When inclement weather threatens, call the university's WeatherChek voice mail message line (203-392-SNOW) to hear the latest official information on possible delayed openings, class cancellations, or the closing of the university. Also, I will post the closing on my web page as soon as I receive word. In the event that an exam is scheduled on a day that is canceled, the exam will be given at the next class meeting. Consult the web page for exam updates and changes.

**Some Final Thoughts:** Unfortunately, the question of academic honesty occasionally becomes an issue between an instructor and a student. The best way to avoid this is to be sure that no suspicions arise. **Cheating on exams or any phase of this course will not be tolerated. The student handbook outlines the various prerogatives of the instructor in cases of academic dishonesty.**

## COURSE SCHEDULE

Date	Chapter	Topic
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9/11	1	Environmental Chemistry, a global perspective
9/11 & 9/18	9	The Hydrosphere (Review of equilibrium, acid-base, complex formation)
9/18 – 9/25	10	Distribution of Species in Aquatic Systems
9/25 – 10/2	11	Gases in Water
10/2	12	Organic Matter in Water
10/9	13	Metals in the Hydrosphere
10/16	14	Environmental Chemistry of Colloids and Surfaces
10/23	15	Microbiological Processes
10/30	<b>Mid-Term</b>	
11/6	15	Water Pollution and Waste-Water Treatment
11/13	2	The Earth's Atmosphere
11/13 – 11/20	4	Tropospheric Chemistry - Smog
11/20 – 11/27	6	Atmospheric Aerosols
11/27 – 12/4	5	Tropospheric Chemistry - Precipitation
12/11	3	Stratospheric Chemistry - Ozone
12/18 5:15 - 7:15	<b>Final Exam</b>	Cumulative