CHE246 Environmental Chemistry
Spring 2012
Nobel 305 MWRF 8-8:50,
Lab Nobel 202 T 8-9:50

Jeff Jeremiason, x6235
Nobel 206c
Office Hrs: MW 2:30-3:30
and by appt.

Text:
Baird, C. and Cann, M. Environmental Chemistry 4th edition, Freeman, 2008.

Course Description

Environmental Chemistry explores both the underlying chemical aspects of environmental issues and the chemistry of Earth's natural processes in air, water, and soil. This course will cover the chemistry underlying environmental issues such as water pollution, smog, stratospheric ozone depletion, and global warming. Energy will also be a major topic of the course as we will examine current fossil energy and alternative energy sources. Environmental issues will be introduced topically and the chemistry and Earth processes related to the topic will be explored. Laboratories will involve developing quantitative methods of analysis of environmental pollutants, interpreting results relative to environmental literature, and modeling.

Grading

Quizzes (5)	25 %	A	>93%
Labs	30 %	A-	90-93
Class Participation	5%	B+	87-90
Problem Sets	10 %	B	83-87
Mid-term exam (March 23)	15 %	B-	80-83
Final exam (Fri. May 18)	15 %	C+	77-80
		C	73-77
		C-	70-73
		D	60-69
		F	<60

Quizzes
Quizzes will be a combination of multiple choice, short answer and problem solving. Makeup quizzes will only be allowed by prior arrangement and for legitimate reasons. Missed quizzes result in a score of zero.

Quiz 1	Feb 24
Quiz 2	Mar 9
Quiz 3	Apr 13
Quiz 4	Apr 27
Quiz 5	May 11

Problem Sets
Homework assignments will be posted on Moodle and will consist of selected problems from the text and other problems and will be assigned on roughly a weekly basis. Late homework is not accepted.

Class Participation
Class attendance on Thursdays (journal reading) is required and all are expected to engage in discussions related to lectures, labs and journal reading. The class participation grade will be based on involvement in class discussions, participation in current environmental chemistry discussions, and on attendance.

Laboratory
All students will be required to keep their own notebooks. All lab write-ups will follow a specific format which will be posted on the course moodle site in the form of a grading rubric. Below is a list of the labs and more details will be available on moodle.

Env Chem Labs:

1. PAH analysis of car exhaust and other combustion sources
2. Pb isotopes and metals analysis in sediment cores
3. Biodiesel synthesis and analysis – use different types of vegetable oil and confirm identity using MS
4. Phosphorus and sediment loading to Seven Mile Creek
5. Ion balance in water – measure all major anions and cations
6. Computer modeling: MINEQL and STELLA

Class Topics

A complete weekly schedule for the class is found on the course moodle site. The following chapters are covered:

1. Stratospheric Chemistry: The Ozone Layer
2. The Ozone Holes
3. The Chemistry of Ground-Level Pollution
5. The Detailed Chemistry of the Atmosphere
6. The Greenhouse Effect
7. Fossil Fuel Energy, CO_2 Emissions, and Global Warming
8. Renewable Energy, Alternative Fuels, and the Hydrogen Economy
10. Pesticides
11. Dioxins, Furans, and PCBs
12. Other Toxic Organic Compounds
13. The Chemistry of Natural Waters
15. Toxic Heavy Metals

Academic Honesty

Every student is required to sign the honor code on each quiz or exam. Gustavus Adolphus College is proud to operate under an honor system. The faculty and students have jointly created an Honor Board to enforce this policy. Please see the academic catalog for full details of the academic honesty policy. Depending on the severity of the violation, in this class you will generally receive a zero for the first academic honesty violation and fail the course for a second violation. Homework assignments are exempt from the academic honesty policy in this course. In fact, you are encouraged to work together on homework assignments.

Disability Services

"Section 504 of the Rehabilitation Art of 1973 and the Americans with Disabilities Act (1990) work together to ensure 'reasonable accommodation' and non-discrimination for students with disabilities in higher education. A student who has a physical, psychiatric/emotional, medical, learning, or attentional disability that may have an effect on the student's ability to complete assigned course work should contact the Disability Services Coordinator in the Advising Center, who will review the concerns and decide with the student what accommodations are necessary."

Disability Services Coordinator Laurie Bickett (lbickett@gustavus.edu or x6286) can provide further information.