

FT01
Chemistry in the Environment
Syllabus, Fall 2002
L.W. Potts

This First-Term Seminar course introduces students to critical thinking and a discussion of values, and develops oral and written communication skills, through an investigation of aspects of the environment that are strongly affected by the production and use of man-made chemicals. Among the topics covered will be the chemistry of the Earth's atmosphere and hydrosphere, the production of energy, the carbon cycle, and fossil fuels, and the role of chemistry in the production of food, and pesticides (insecticides, rodenticides, and herbicides), their degradation products and potential health effects. Policy implications of remediation will be discussed. One year of high school chemistry is required, so that we will be able to move beyond basic bonding, structure, and function. More details about the course are presented in a separate handout.

Instructor:

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Textbooks:

C. Stanitski, L. Eubanks, C. Middlecamp, and W. Stratton, *Chemistry in Context (Applying Chemistry to Society)* 3rd Ed. New York: McGraw Hill, 2000. This will serve as the primary textbook for the course, and will provide the basic chemistry and environmental factual material. The book assumes no college-level chemistry, and is used at many colleges as a text for non-science students. In this course, we will study chapters 1-6, as they relate most directly to environmental science. Problems at the end of chapters will be assigned, collected, and graded.

A. Lunsford, *The Everyday Writer*, 2nd Ed. This is a rhetoric book that we will refer to when writing and critiquing short papers and the research paper. It contains valuable information on style and mechanics. Students can expect to use this in future courses at Gustavus.

G. Benford, *Timescape*. New York: Bantam Books (paperback) 1992. This "hard science fiction" book (meaning that it contains more physical science than fantasy) is the story of Earth in the midst of an environmental catastrophe, and the attempt by scientists to mitigate it by communicating instructions to scientists in the past. Not only is the environmental problem interesting, the paradoxes of time travel and communication make the storyline engaging and pull the reader along.

Schedule:

Week 1	9/4-9/6	Unit I: The atmosphere
Wed		Introduction to people, course, assign reading
Thursday		The atmosphere CinC: Chapter 1: sections 1.1-1.7. Problems assigned.
Fri		Units and ratios, gas law Ch 1.7-1.15 First writing assignment given.
Week 2	9/9-9/13	Unit I: The atmosphere
Monday		Chemical concepts in Ch 1. Problems due.
Wed		Chapter 2 material. Problems assigned.
Thursday		video
Fri		First writing assignment draft due (critique)
Week 3	9/16-9/20	Unit I: The atmosphere
Monday		Chapter 2 material. Problems due.
Wed		Chapter 2 material
Thursday		Library orientation (?)
Fri		First writing asmt final draft due; give second writing assignment
Week 4	9/23-9/27	
Monday		Chapter 3. Problems assigned.
Wed		Chapter 3
Thursday		Policy and Law, CAFE standards, Clean Air Acts.
Fri		Second writing assignment draft due (critique). Problems due.
Week 5	9/30-10/4	Unit II: The hydrosphere
Monday		Policy and Law
Wed		No class (Nobel Conference)
Thursday		Chapter 5. Problems assigned.
Fri		Second asmt final draft due. News report.
Week 6	10/7-10/11	
Monday		Chapter 5
Wed		
Thursday		Chapter 5 Problems due
Fri		Chapter 5. News report.

Week 7 10/14-10/17

Monday	Chapter 6. Problems assigned.
Wed	Chapter 6
Thursday	Library orientation for research papers (at Library)
Fri	No Class (Break)

Week 8 10/21 - 10/25 Unit III: Metals and pesticides

Monday	No Class (Break)
Wed	Research paper planning, metals. Problems due.
Thursday	Metals
Fri	Mid Term Exam (1 hr, 100 points).

Week 9 10/28 - 11/1

Monday	Registration planning (advising)
Wed	Pesticides
Thursday	Pesticides
Fri	First research paper outline and bibliography due. News report.

Week 10 11/4-11/8

Monday	Hazardous waste
Wed	Hazardous waste
Thursday	video
Fri	Analytical technology. Draft research paper. News report.

Week 11 11/11-11/15

Monday	Timescape introduction, schedule, Green Chemistry
Wed	Green Chemistry (Timescape)
Thursday	Timescape
Fri	Green Chemistry, Final draft research paper.

Week 12 11/18-11/22

Monday	Timescape. Second research paper proposal due.
Wed	Green Chemistry (Timescape)
Thursday	Timescape
Fri	Green Chemistry, Policy. News report.

Week 13 11/25-11/29

Monday	Policy and Law (Timescape)
Wed	Timescape
Thursday	Thanksgiving break
Fri	Thanksgiving break

Week 14 12/2 -12/6

Monday	Policy and Law. Draft 2 nd research paper. (Timescape)
Wed	Timescape
Thursday	Timescape Overview
Fri	2 News reports.

Week 15 12/9-12/13

Monday	Catch-up
Wed	Recap course material
Thursday	Recap course material
Fri	Final draft 2 nd research paper. Hints for final exam. (Last day of class)

Final Exam:

Tuesday, December 17, 2002, 1pm-3pm, regular classroom. (100 pts).

Grading:

Grades in this course will be determined by performance in the following six areas:

Two exams (equal wt.):	35%
Four short papers:	45%
Problem sets:	10%
News Report:	05%
Classroom participation	05%

Incompletes: Students may be given grades of *I* (incomplete) if they are unable to attend class or complete assignments for reasons beyond their control, deemed acceptable by the Dean of Students.