STUDENT COURSE INFORMATION

Environmental Chemistry I

Chem-130

FALL 2003

Instructor: Kim Bolton

Required Materials

(a) Text book: Introduction to Environmental Chemistry, N.J. Bunce; Introduction to Environmental Chemistry ! Answer Guide, N.J. Bunce.

(b) Laboratory Manual: Laboratory Manual for Chemistry 130 can be purchased in the Chemistry Department (location will be announced).

(c) Safety Goggles and a Lab Coat must be worn in the laboratory. They are both available at the University Book Store.

(d) Electronic calculator: Calculators or notebook computers capable of storing text information are not allowed in examinations.

(e) Additional Reading Material: Copies of some general chemistry text books are on reserve in the University Library. You may wish to consult these for additional reading or problems.

Introduction

This information for Chem 130 clearly identifies what is to be learned, the expectations of the instructor, all the administrative details of the course, and it provides you with a detailed course schedule. Please read through this information ! it will answer most of your initial questions about Chem 130.

Chemistry plays a central role in science and hence is a basic requirement for all science degrees. In this course our objectives are two-fold: to introduce you to the chemical principles which govern chemical reactions in the environment, and to introduce you also to some specific problems in environmental chemistry. Environmental chemistry is governed by the same principles as chemistry in the laboratory or industrial plant: we need to know **how much** of a product is formed (stoichiometry), whether the reaction is **feasible energetically,** and **how fast** the reaction will proceed under defined conditions.

The Chem-130 course is the first of a two-part first year program in introductory environmental chemistry. It is expected that students will register in Chem-131 following successful completion of Chem-130.

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Lectures

Lectures will include both theoretical concepts and problem exercises to illustrate their applications. It is essential that you attend all three meetings of the class per week.

Laboratory

The laboratory is an integral part of the course. Please refer to the Laboratory Schedule included in this information. Laboratories begin in Week 1. Bring your Laboratory Manual to the lab in Week 1. Consult your timetable for details of your lab time and location. You must take all labs in the time period to which you are assigned.

A brief quiz will be held at the beginning of some labs. These quizzes will count towards your lab mark, and will usually be based upon the experiment that you are about to perform. It is therefore essential that the experiment be studied carefully in advance of the laboratory period in which it is to be done.

There will be a special Problem Lab during the week prior to Mid-term exams. Students will be given a set of problem questions as a pre-exam practice.

Office Hours

Dr. Bolton has Office Hours during which a student can obtain help regarding lecture material:

Mondays	**10:30 am - 12:00 pm; 1:30 pm - 4:00 pm**
Wednesdays	**1:30 pm - 4:00 pm**

Evaluation

Your course grade will be made up as follows:

Midterm Exam I: Monday October 6, 4:30 pm (In class)	**15%**
Midterm Exam II: Wednesday, November 5, 4:30 p.m. (In class)	**20%**
Laboratory	**20%**
Final Examination (scheduled by the Registrar's Office)	**45%**
	100%

All examinations will be closed book, with no written or printed materials of any kind permitted in the examination room. Electronic calculators may be used on all quizzes and examinations. No electrical outlets for calculators will be available in the examination rooms. Computers and alpha-numeric calculators of any kind are not allowed.

Policy on Missed Examinations

A grade of zero will be assigned for any missed laboratory, test or examination except for valid medical or compassionate reasons. Medical or compassionate reasons that may excuse you from the missed work can be considered only if you follow the correct procedure for requesting such an exemption.

Missed Midterm Test

For a missed midterm, **documentation must be given to Dr. Bolton in person**. Do not request that academic counsellors or others mail the documentation to the Chemistry and Biochemistry Department. We are not responsible for documentation lost because it was not sent to the right person. There is no need to consult a doctor solely to obtain a note. However, if you have consulted a medical practitioner, the doctor's note is acceptable documentation.

In the case of a missed midterm, if a valid excuse is received, the percent value of the midterm will be added to the final examination. No make-up midterm examination will be given.

Missed Final Examination

In the case of a missed final examination you should consult the Undergraduate Calendar for the appropriate course of action.

Schedules

Lecture and Reading Schedule, Fall 2002

Week	Lecture	Material covered in lecture	Chapters
Sept. 8 - 12	1 to 3	Introduction Stoichiometry	Chapters 1 and 2
Sept. 15 - 19	4 to 6	Stoichiometry	Chapter 3
Sept. 22 - 26	7 to 9	Stoichiometry Thermochemistry	Chapter 3 **Chapter 4 is assigned as Home Reading**
Sept. 29 - Oct. 3	10 to 12	Thermochemistry Photochemical Reactions	Chapter 5
Oct. 6 Oct. 8 Oct. 10	**Midterm Exam** 13 14	Atmosphere, Gases	Chapters 5 and 6
Oct. 13 Oct. 15 and 17	**Holiday** 15 and 16	Global Warming	Chapter 6
Oct. 20 - 24	17 to 19	Kinetics	Chapter 7
Oct. 27 - 31	20 to 22	Kinetics	Chapter 7
Nov. 3 **Nov. 5** Nov. 7	23 **Midterm Exam** 24	Kinetics Kinetics	Chapter 7
Nov. 10 - 14	25 to 27	Gaseous Equilibria	Chapter 8
Nov. 17 - 21	28 to 30	Tropospheric Chemistry Water	Chapters 9 and 10
Nov. 24 - 28	31 to 33	Water Review	Assigned Home Reading: 10.1, 10.2.1 10.2.3, 10.8.3

Final Examination will be scheduled by the registrar.

Laboratory Schedule, Fall 2002

Week	Dates	Laboratory	Quiz
1	Sept. 8 - 12	Sign-In and Safety	No
2	Sept. 15 - 19	Experiment 1 Chemical Reactions in Aqueous Solution	**Yes** (on Safety)
3	Sept. 22 - 26	Experiment 2 Gravimetric Analysis of Copper	**Yes**
4	Sept. 29 - Oct. 3	Help Session for Midterm 1	No
5	Oct. 6 - 10	Experiment 3 Standardization of Sodium Hydroxide	**Yes**
6	Oct 13 (Holiday) Oct. 14 - 17	Experiment 4 Calorimetry	**Yes**
7	Oct. 20 - 24	Experiment 5 Molar Volume of Nitrogen	**Yes**
8	Oct. 27 - 31	Help Session for Midterm 2	No
9	Nov. 3 - 7	Experiment 6 Chemical Kinetics	No
10	Nov. 10 - 14	Experiment 7 (Computer Simulation) Gas Phase Equilibria: $SO_2/O_2/SO_3$ System	No
11	Nov. 17 - 21	Experiment 8 Hardness of Water	No
12	Nov. 24 - 28	Clean-up Help Session for Final Exam	No

Weekly Problem Assignments

The problem assignments are designed to aid in the understanding of the lectures. **Do not** allow yourself to fall behind with the problems. The material multiplies fast and you will have serious difficulty in catching up. Make a real attempt to work the problems independently. Working problems from the solutions is not a useful way of developing your problem-solving skills. If you get into difficulty, it is your responsibility to seek help as soon as possible.

ASSIGNMENTS FROM THE TEXT BOOK

Chapter 1 All

Chapter 2 **2.1** All **2.2** All **2.3/2.4** 1 to 9 **2.5** 2, 3, 5, 6, 7, 8 **2.6/2.7** All **2.8** 1 to 4

Chapter 3 **3.2** 2,4 **3.3** 1,2,3 **3.4** 1,3,4,5 **3.5** 1,2,5 **3.6** 1,3,5 **3.7** 4,5,10

Chapter 5 **5.1/5.2** 1,3 **5.3/5.4** All **5.5** 1,2,4,6 **5.6** All **5.7** All **5.8** 2,3,4,5

Chapter 6 **6.1** 1,2,3,6,7,9,10 **6.2/6.3** 1,2,3,4,5

Chapter 7 **7.1/7.2** 1,2,3,4 **7.3** 1,2,3,4,6,7 **7.4** 1,2,3,4,6 **7.5** 1 **7.6** All **7.7** 1,2 **7.8** 1,4,5 **7.9** 1,2,3

Chapter 8 **8.1** 1,2,3 **8.4** 2,3,5,6 **8.7** 1,3,5,6,7,8,9,11

Chapter 9 **9.1** 3,5 **9.2** 1,3 **9.3** 1,3,5 **9.6** 1,2

Chapter 10 **10.1/10.3** 2,4,5,6,8,91 **10.4/10.6** 1,3 **10.7** 1,3,4,6 **10.8** 1,4