

CARNEGIE MELLON UNIVERSITY

Department of Chemistry

09-106: Modern Chemistry II

Syllabus

Spring Semester, 2007

- Lectures:** Monday, Wednesday and Friday 11:30 -12:20 p.m., Doherty Hall 2210
- Recitations:** The lecture rooms for the recitation sections (Tues and Thurs) are:
6:30-7:20 A: WEH 6423 C: BH 237B E: WEH 8427
7:30-8:20 B: WEH 6423 D: PH 226B F: WEH 8427
- Web site:** All course handouts are available on the blackboard site, along with a list of assignments and upcoming due dates (<http://cmu.edu/blackboard/>)
- Instructor:** David Yaron
Mellon Institute 501
yaron@chem.cmu.edu
268-1351
- Recitation Instructors:** Lenny Vuocolo
Greg Drozd
Nicolae Albu
- Office Hours:** To be announced and posted on web site.
- Textbook:** Oxtoby, Gillis, and Nachtrieb, "Principles of Modern Chemistry" (ISBN: 0-03-035373-4). Reading assignments and practice problems will be announced in lecture and posted on the blackboard site.
- Workload:** It is assumed that you will spend at least 10 hours per week on this course: 5 in lecture and recitation, and at least 5 outside the classroom.
- Group work:** You are encouraged to work in groups on the graded homework assignments. This means you can work together on the problem, but you must write your own solution. In online activities, this means you can work together, but you must carry out your own online experiments and write-up your own results.
- On your homework, you must list the members of your work group.
- Note: Every member of the group must be involved in finding the solution. Group work does not mean copying the answers of other members in your group.*

Grading:

The final grade will be based on the following point distribution.

Activities: 100pts Activities (in recitation and textbook problems) will be graded for a total of 10 pts per week. The lowest two grades will be dropped.

Homework: 100pts There will be weekly homework assignments, excluding weeks containing an hour exam. The lowest grade will be dropped.

Exams: 400pts There will be 3 one-hour exams.
Tentative Dates: Tuesday, February 13
Thursday, March 29
Tuesday, May 1

and a comprehensive final exam.

All exams will be graded on a 100pt scale. The 400pts used in determining the final grade will be obtained by writing down the scores for each of the hour exams once, and the score for the final exam three times:

exam1 exam2 exam3 final final final

The lowest two scores in the above list will then be dropped. If your final is your highest score, it will count for 75% of your exam grade. If you do not do well on the final it will count for only 25% of your exam grade.

Bonus Points On some of the homework problems, there will be questions for bonus points. These will be added on to your grade, after the course grading curve has been established.

The course will be curved, based on the 600 non-bonus points listed above, such that the grade point average for the class is between 2.8 and 3.0. It is at this stage that the range for A,B... grades will be established. Then, the bonus points will be added to student scores.

Makeup exams and quizzes:

NOTE: No make-up exams or quizzes will be given. Since the grading scheme is designed to allow low scores to be dropped, a missed exam or recitation will not be counted in the final average.

List of topics (tentative)

(numbers refer to textbook sections)

Thermo I Thermochemistry

7.1-7.4 First law of thermodynamics
7.5 Thermochemistry

Thermo II Entropy and free energy

8.1-8.6 Spontaneous Processes and Entropy
8.7 Free Energy and Spontaneity

Exam 1

Kinetics Rates of Reactions

13.1 Reaction Rates
13.2-13.7 Reaction Mechanisms

Chemical Equilibrium

9.1-9.3 Describing Chemical Equilibrium
9.4-9.5 Using the Equilibrium Constant
9.6-9.8 Changing the Reaction Conditions; Le
Chatelier's Principle

Exam 2

Acids and Bases

10.1-10.2 Acid-Base Concepts
10.3 Acid and Base Strengths
10.4 Solutions of a Weak Acid or Base
10.5-10.7 Buffers and Titration

Solubility

11.1-11.4 Solubility Equilibria
11.5 Complex-Ion Equilibria

Exam 3

Electrochemistry

12.1 Electrochemical cells
12.2-12.3 Nernst equation

Special Topics

Final Exam

Tentative Schedule

January						
	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>
7	8	9	10	11	12	13
14	Thermo I					20
21	Thermo I					27
28	Thermo I		Thermo II			3

February						
<i>S</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>
4	5	6	7	8	9	10
11	Thermo II					17
18	II	Exam I	Kinetics			24
25	Kinetics					3
	Kinetics		Chemical Equilibrium			

No Class

March							
<i>S</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	
4	Chemical Equilibrium					Break	10
11	Spring Break					17	
18	Chemical Equilibrium/Acid Base					24	
25	Acid Base			Exam 2		31	

April							
<i>S</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>	
1	Acid-Base					7	
8	Acid/Base Solubility					14	
15	Solubility			Carnival			21
22	Solubility/Echem					28	

May						
<i>S</i>	<i>M</i>	<i>T</i>	<i>W</i>	<i>T</i>	<i>F</i>	<i>S</i>
29	Echem	Exam 3	Special Topics			5