

**Chemistry 13 : Chemical Principles**  
**Fall 2005**  
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**General Information**

**Chemistry 13** is the second part of a two-semester introductory general chemistry course for science, engineering, and technology majors, it is the continuation of Chem 12. The laboratory courses Chem. 14 and Chem. 15 complement these courses, and are scheduled separately. Chem 13 differs from Chem 12 in one important respect.

**Chem 12 had alot of carry-over of material from high school courses,  
Chem 13 has very little.**

The format of Chem 13 places a larger responsibility on you to master the subject matter of the course. A systematic approach will be a great help to you. For example, each chapter has a set of **summary of facts and concepts** at the end. In general, all of these are significant ones that you should attain. As you start studying a new chapter **before lecture**, scan summaries as a preview to what you will accomplish. Then, as you study each section, refer back to this to see which ones apply and to focus what you have done. After lecture, review these again as you re-do the exercises. If you still have difficulty with some of the problems, be sure to seek help and get a clarification immediately.

The lectures, the book, and the problems are **complementary** learning tools. You are responsible for all of them. **The level of the lectures will be set assuming that you have done and understand the problems and the readings.** Everything on exams will at least have been touched on in lectures, but greater depth in a particular area may come from problems and readings. Some homework problems will be placed directly on exams and others will be modified slightly. This is intended to serve as a way to raise the grades of those who have kept up and understood the homework. You are encouraged to see me privately if you begin having trouble with any of the material. I will have posted office hours by the beginning of the second week of classes.

**Text required:** General Chemistry, Darrell D. Ebbing, Houghton Mifflin, Boston, 8th Edition, 2005, ISBN 0-618-39941-0.

**Calculator required:** Electronic calculator capable of handling logarithms and exponential notation.

**Attendance:** University regulations state that a student should attend **every** scheduled class (Policies and Rules for Students section 42-27). Frequent absence from class is unacceptable. If you miss a class it is **your** responsibility to determine what material, announcements, handouts, graded papers, etc., were missed due to your absence. There will be no make-ups for missed lectures. You should arrange for one of your classmates to hold returned papers in the event you are absent when papers are returned. I do not assume responsibility for holding papers if you are not there to pick them up, or have not made arrangements for someone else to pick them up. I will, of course, **try** to hold unclaimed papers for a few days.

**Office Hours** will be posted outside my office door by the beginning of the second week of classes.

**Homework:** Homework assignments are given in the schedule. You are not required to turn in the assignment and consequently a homework score does not contribute directly to the course grade.

You should work out the suggested problems and exercises, since they are typical of what you are expected to master and handle with ease. Also, problems from the homework assignments are regularly selected for inclusion on the exams. If you have questions about the homework, you should raise questions in class or see me outside of class and seek help from peer tutors.

**Grading** for the course will be based on three evening examinations, a final examination and a maximum of 14 quiz grades. There will be no extra credit assignments. The exact procedure for computing the final course grade is described later.

**Examinations:** There will be three examinations and a final examination. All three examinations will be night exams and will take 1 hour and 50 min to complete. The dates of these examinations are given in the attached assignment schedule. The topics covered on the exams will be announced in advanced. You must **SIGN AND PRINT** your name on the first page with your ID number in order to get credit for taking the exam.

**Make-up examinations** will be given only if I have prior notice with a **justifiable** and **documented** cause (illness or family emergency). A single make-up examination will be provided near the end of the semester and will cover the material of all three examinations and will **NOT** have any multiple choice questions. Individual make-up examinations following each examination will not be provided. Rules for deferred grades are determined by the Registrar.

**Quizzes:** You must **SIGN AND PRINT** your name on the first page with your ID number in order to get credit for taking the quiz.

**Computing the Course Grade:** The three examinations will average as 50% and the final examination will count as 30% of your final grade for a total of 80%. The average quiz grade will count as 20% of your final grade. The **tentative** grade scale is as follows.

<u>Percentage</u>	<u>Grade</u>
90 or more	A
85 or more	A-
83 or more	B+
80 or more	B
77 or more	B-
75 or more	C+
70 or more	C
60 or more	D
Less than 60	F

**Dropping the Course:** Contact the Office of the Registrar. No course can be dropped after the end of the drop period. This date, and your final exam time and date, as well as other useful information is always appended to the copy of course offerings for any semester. This usually occurs just before or just after the **THIRD** scheduled examination in this course (This semester, the third exam is scheduled before the last day to drop). **Caution!** in dropping courses is advised because of a maximum (during your entire PSU tenure) allowed number of credits you may drop between the end of the "free" drop period until the end of the allowed drop period (when you have to pay to drop).

**Seating Assignments** for lectures will be posted **if I think it is needed**. If you wish to sit in the front half of the room, please give me a sheet of paper with your name, section and request for a front half seat prior to the end of the third lecture. Should you wish to have your assigned seat changed, please notify me in writing. You will have assigned seats in **recitation**, which must be written on the front of your exams and quizzes to get credit.

**Campus Statement on Academic Integrity**, adopted by the Altoona Campus Faculty Senate on March 19, 1985.

"Academic integrity is the pursuit of scholarly activity free from fraud and deception and is an educational objective of this institution. Academic dishonesty includes, but is not limited to cheated, plagiarism, fabrication of information or citation, facilitating acts of academic dishonesty by others, unauthorized prior possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students." (Policies and Rules for Students, Section 49-20)

**Consequences of Academic Dishonesty:**

"The penalty for academic dishonesty in less serious cases consists of a failing grade for the work or test where this misconduct occurred. *This decision is made by the instructor*. For more serious cases of dishonesty, the penalties are more severe, (including automatic failure for the course, probation, suspension or expulsion from the University), and formal due process procedures are available for the student and faculty involved. Section 49-20 of the Policies and Rules for Students provides the details on these procedures."

**Scheduled Classes Not Met:**

In **Extraordinary** circumstances (which have occurred from time to time in the past, and which will occur from time to time in the future), when classes are missed due to reasons other than instructor illness, power failures, weather, and the like, in which the missed classes are not made up), missed classes will be rescheduled if possible, in conjunction with the Office of the Registrar. Any such rearranging and rescheduling would be announced in class so that appropriate arrangement could be made by all.

**Expected Background (from Chem 12):** Each Chem 13 student is expected to have had the **general** content of Chem 12 or its equivalent. You are responsible for this material **on your own**, and your understanding of it will be assumed in the lectures, homework, and examinations.

Not all parts of Chem 12 are of equal importance to success in Chem 13. Some items, however, are of such importance that an immediate review should be the first order of business for you. Those ideas and techniques which are **essential** as a background are listed below. If you find any of the exercises to be unfamiliar, refer back to the chapter for explanation. The topics are listed in the order of their need in Chem 13.

- 1.) **Chapter 3**  
Mole concept, Mole/gram conversions, Stoichiometry of reactions
- 2.) **Chapter 4**  
Section 4.7 Solution concentrations-molarity  
Section 4.1 Definitions of strong and weak electrolytes
- 3.) **Chapter 12**  
Section 12.2 Definition of saturated solution
- 4.) **Chapter 4**  
Section 4.5 Definitions of oxidation-reduction
- 5.) **Chapter 6**  
Section 6.3 Meaning of enthalpy;  $\Delta H$
- 6.) **Chapter 9**  
Section 9.6 Lewis Formulae
- 7.) **Chapter 10**  
Section 10.1 Shapes of molecules
- 8.) **Chapter 11**  
Section 11.6 Structure and bonding in solids



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Tentative Weekly Assignment Schedule For Fall 2005

DATE	TOPIC	READING	EXERCISES
W Aug. 31	Chemical Equilibrium	<u>15</u>	Do as many as you can from each heading. Will use all of this heavily.
F Sept. 2	Strong Acids and Bases Weak Acids and Bases Self-Ionization of Water	<u>4.1, 16.1-2</u> <u>16.6-8</u>	Will give you assignments as we go.
M Sept. 5	$K_a$ $K_b$ Salt Solutions Chemical Structure Lewis Theory	<u>17.1-4</u> <u>16.4-5</u> <u>16.3</u>	
F Sept. 9	Acids/Bases Cont.		
M Sept. 12	Periodicity  Active Metals: Groups I & II	<u>8.5-7</u> <u>22.1-3</u>	
F Sept. 16	Active Metals Cont. Solubility Equilibria	<u>4.3, 18.1-2</u>	
M Sept. 19	Precipitation/Dissolution	<u>18.3-4</u>	
F Sept. 23	Spontaneity, Enthalpy Entropy	<u>19.1-3</u>	
<b>F SEPT. 23</b>	<b>FIRST EXAMINATION</b> <b>(Covering material up to and including lecture on Active Metals)</b> <b>5:00-7:00 PM, 117 SCI</b>		
M Sept. 26	Free Energy Free Energy, $K_{eq}$	<u>19.4-5</u> <u>19.6-7</u>	
F Sept. 30	Oxidation Numbers	<u>4.5, 20.1</u>	
M Oct. 3	Voltaic Cells, EMF Redox Reactions, Batteries	<u>20.2-5</u> <u>20.6-8</u>	
F Oct. 7	Batteries Cont. Electrolysis	<u>20.9-11</u>	



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M Nov. 21      Modern Materials :  
Liquid Crystals & Polymers      p. 453-4, 25  
Ceramics & Thin Films      13.7

T Nov. 22      Modern Materials Cont.  
Alloys & Metallurgy I      13.1-3

**NO CLASSES NOVEMBER 23-24 FOR THANKSGIVING**

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M Nov. 29      Alloys & Metallurgy II      22.4  
Nuclear Reactions      21.1-2

F Dec. 3      Half Life Mass/  
Energy Conversion      21.3-7

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M Dec. 6      Fission/Fusion      21.7

F Dec. 10      Catch-Up Day

**MONDAY, DECEMBER 12<sup>th</sup> COMPREHENSIVE FINAL EXAMINATION DURING FINAL  
EXAM PERIOD.  
1:00 – 2:50 PM, 117 SCI**

Special emphasis will be placed on the last topics not covered on the exams.

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**No multiple choice questions will be asked on examinations (Final is multiple choice).**

**It is recommended that you work more than the assigned problems.  
Work as many as possible of the combined skills problems is also advised.**

**I recommend that you form small study groups of three or four to work/discuss the problem assignments.**