

# CHEMISTRY 222 - General Chemistry II (64226)

## Portland State University, Spring 2011

- Instructor: Dr. Adenike Otoikhian  
Science Building II, Room 304  
Email: [aotoikhi@pdx.edu](mailto:aotoikhi@pdx.edu) (preferred means of contact)
- Lecture: MWF 9:00 – 10:05; March 28<sup>th</sup> – June 7<sup>th</sup> 2011  
Venue: ASRC 230 (room 230 in the New Rec Center)  
Attendance is **mandatory**.
- Office Hours: Monday and Wednesday: 11:00 am – 12:00 noon  
Friday: 10:30 am – 11:30 am
- Text: Chemistry, A Molecular Approach, Second Edition, Nivaldo J. Tro, Pearson/Prentice Hall (2010). Custom Edition for Portland State University. Available at PSU bookstore.
- Resources: (i) Chemistry Tutors – Science Building I, Room 221 (schedule posted on the door)  
(ii) Online tutorial and homework companion through Mastering Chemistry  
(iii) Help during my office hours and by appointment
- Course Description: Chemistry 222 is the second course in the chemistry majors' sequence in general chemistry. This course continues to teach the fundamental concepts of chemistry for science, engineering and health professional students (such as pre-dental, premedical, premedical technology and pre-veterinary students). Concurrent enrollment in CH 228 lab for CH 222 is recommended. Topic covered includes: Gas Laws, Thermodynamics, Intermolecular forces, Solution Chemistry, Chemical Kinetics and Chemical Equilibrium.
- Prerequisites: (i) CH 221: General Chemistry I  
(ii) High school chemistry or an equivalent preparatory course.  
(iii) Completion of or concurrent enrollment in Mth 111 or high school algebra and trig (pre-calculus)
- Course Objective: The overall objectives of this course are:
- To learn and understand basic chemical concepts
  - To establish a connection between chemistry, your chosen field of study and the real world applications of chemical phenomena
  - To build and develop problem-solving skills
  - To improve on science literacy and communication of scientific ideas

I will strive to make lectures as interesting and attention grabbing as possible. I will provide you with examples when appropriate. My hope is that this will make you see chemistry as an exciting and vibrant field of study with a great deal of real-world applications.

Exams: There will be three, one-hour midterms and a two-hour final exam. The final exam will be comprehensive. The materials to be covered during each exam are shown on the schedule. Calculators are required.

Homework: Two different types of homework will be assigned:

(1) **Non-graded homework:** These are homework problems assigned from the textbook. These *will not* be graded. The answers to these problems are provided in the back of the textbook and in the solution manual. In addition to the assigned problems, you should also complete the “For Practice” and “For More Practice problems” in the textbook.

(2) **Graded homework:** Graded homework problems will be managed through the Mastering Chemistry web-based program through Pearson/Prentice Hall. To access this program, go to [www.masteringchemistry.com](http://www.masteringchemistry.com), register for Mastering Chemistry with your student access code and log in to the online course for CH222 using the Mastering Chemistry course ID listed below. You will have access to each assignment one week before the due date. Each assignment will be due by **11:30 pm PDT** (Pacific Daylight Time) on its due date, which will always be a Sunday. **DEADLINES FOR THESE HOMEWORK ASSIGNMENTS WILL NOT BE EXTENDED – NO EXCEPTION WILL BE MADE.** If you miss a deadline, you will receive a score of zero for the assignment. There will be a total of 10 assigned homework sets and each homework problem set will contain 12 questions worth one point each. Your overall homework score will be based upon a maximum of 100 points.

I can't stress enough the importance of doing the homework problems (both the non-graded and graded homework). Some midterm and final exam problems may be taken from these problem sets. **Success in this course is strongly correlated with time spent working problems.** Waiting until the last minute (i.e. just before the due time or just before an exam) to work on problems gets you stressed out and rarely results in success.

**Mastering Chemistry Course ID:** MCOTOIKHIAN80330

General Info: You are responsible for all information given during class times. This includes homework assignments and any special announcement or schedule changes. Lecture notes and any other relevant course materials will be posted on Desire2Learn (D2L: [www.d2l.pdx.edu](http://www.d2l.pdx.edu)) **AFTER** each lecture. Read up on the scheduled topics before the next lecture. It is your responsibility to make sure you keep up with the demands of the course. If you are falling behind you should seek for help immediately. Ask for help from your classmates, use mastering chemistry online tutorial, and use my office hours. I also strongly encourage that you use the help of the chemistry tutors assigned by the department. Success in this class is a function of how hard you are willing to work. I do not give the grade, you earn your grade. Before beginning this class, I encourage you to ask yourself the question: what do I hope to accomplish in this class? The answer to this question will go a long way to motivate you and keep you focused on your academic goals.

Grading: Your grades will be determined by the total number of points you accumulate on homework and exams. There will be a total of 500 points possible in the course. Points can be obtained as follows:

**Midterm I: Wednesday, April 13<sup>th</sup> – 100 point possible**  
**Midterm II: Monday, May 2<sup>nd</sup> – 100 points possible**  
**Midterm III: Friday, May 20<sup>th</sup> – 100 points possible**  
**Final exam: Tuesday, June 7<sup>th</sup> (8:00 am – 9:50 am) – 200 points possible**  
**Homework: Online Mastering Chemistry, 10 times; 12 point each, 120 point total – 100 points possible**

For a total of 500 possible points, your lowest scoring midterm will be dropped. If you miss one of the midterm exams, you may lose the opportunity to drop your lowest scoring midterm. Overall poor perform on the homework **CANNOT** be substituted for with a higher scored midterm exam. Also note that the final exam will be comprehensive with a total of 200 point.

**Make a note of exam dates.**

Grades will be based on the percentage of total points scored. The following percentages of total scores guarantee the letter grade shown; however the instructor reserves the right to revise the percentiles downwards depending on the overall class performance.

Grade	A	B	C	D	F
Score	A $\geq$ 93.3% A <sup>-</sup> $\geq$ 90.0 %	B <sup>+</sup> $\geq$ 86.6 % B $\geq$ 83.3 % B <sup>-</sup> $\geq$ 80.0 %	C <sup>+</sup> $\geq$ 75.0% C $\geq$ 70.0 % C <sup>-</sup> $\geq$ 65.0 %	D <sup>+</sup> $\geq$ 61.3 % D $\geq$ 58.3 % D <sup>-</sup> $\geq$ 55.0 %	F < 55%

**Policies:**

1. Missing a Midterm Exam: If you miss a midterm exam, please contact me within 24 hours. I will allow you to reschedule your exam only if your absence was excused, **EXCEPT** in the following cases, where you may need to take the exam ahead of time:

- a) Previous commitments, as allowed by instructor
- b) School-sponsored field trips or athletic events

Illness, work conflicts and family emergencies are considered excused absences. Other instances will be evaluated on a case by case basis. All exams must be made up before the exams are passed back in class. Failure to notify me of the reason for your absence, as well as unacceptable excuses, will result in a score of zero for that exam.

2. Final Exam: Final exam must be written on the scheduled university date. **EXCEPTIONS will not be allowed.**

3. Professional Demeanor: It is expected that you will act with professional demeanor and attitude at all times. This includes, but is not limited to, being respectful at all times to the instructor and to your colleagues. To facilitate a positive learning environment, **it is expected that you refrain from excessive talking and all cell phones/pagers should be turned off during lecture.** Please note that respectful communications are expected when using email or the course discussion board. As a general rule, please refrain from any comments that you would be reluctant to say in person.

4. Dishonesty: I trust that the work you do in this course is your own. Academic dishonesty is greatly frowned upon and will not be tolerated in this course. Cheating during any exam will be reported and the student will receive an “F” for the exam.

5. Accommodation: If you have a physical or learning disability and you need extra accommodation, please be certain you are registered with Disability Services and make appropriate arrangements with me.

6. Grading: Mistakes are sometimes made while grading exams; the good news is that they are usually addition errors, which I will happily fix. On any given exam, you may not perform up to your potential and your exam may not show how much you know. Exam scores have a margin of error. If you believe there has been a serious mistake on grading your exam, you may ask me to re-grade the exam *up to one week after the exam is returned*. If I determine there has been an error in grading your exam and it increases your score by 5 or more points, I will happily fix. If there is not a significant error on your exam and you have asked for a re-grade, I reserve the right to re-grade the entire exam and may assign a score either higher or lower than the original score.

## Chemistry 222

### Lecture and Exam Schedule (Subject to Change)

#### Week 1

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
1/M	Mar 28	Lecture	Mastering Chem	Introduction-Course Outline
2/W	Mar 30	Lecture	5 [179-190]	Gas Laws
3/F	Apr 1	Lecture	5 [190-202]	Ideal Gas/Partial Pressure

#### Week 2

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
4/M	Apr 4	Lecture	5 [203-213]	Kinetic Molecular theory
5/W	Apr 6	Lecture	5 [214-220]	Real Gases
6/F	Apr 8	Lecture	6 [230-240]	Energy, heat and work

#### Week 3

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
7/M	Apr 11	Lecture/Review	6 / review [240-252]	Calorimeter
8/W	Apr 13	<b>MIDTERM I</b>	<b>5</b>	
9/F	Apr 15	Lecture	6 [253-263]	Enthalpy/Hess's Law

#### Week 4

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
10/M	Apr 18	Lecture	6 [263-266]	Enthalpies of reaction
11/W	Apr 20	Lecture	11 [454-467]	Intermolecular Forces
12/F	Apr 22	Lecture	11 [468-480]	Vapor Pressure

\* Written in square brackets are pages of the textbook that you are expected to have read through before each lecture.

**Week 5**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
13/M	Apr 25	Lecture	11 [480-491]	Phase Diagrams
14/W	Apr 27	Lecture	11 / 12 [491-504]	Crystalline Solids
15/F	Apr 29	Lecture/Review	12 / review [512-523]	Solutions/Solubility

**Week 6**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
16/M	May 2	<b>MIDTERM II</b>	<b>6 &amp; 11</b>	
17/W	May 4	Lecture	12 [523-534]	Solution Concentration
18/F	May 6	Lecture	12 [535-547]	Colligative Properties

**Week 7**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
19/M	May 9	Lecture	12 [547-552]	Strong Electrolytes
20/W	May 11	Lecture	13 [562-573]	Reaction Rates
21/F	May 13	Lecture	13 [573-581]	Rate Laws

**Week 8**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
22/M	May 16	Lecture	13 [581-593]	Reaction Mechanisms
23/W	May 18	Lecture/Review	13 / review [593-599]	Catalysis
24/F	May 20	<b>MIDTERM III</b>	<b>12 &amp; 13</b>	

**Week 9**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
25/M	May 23	Lecture	13 / 14 [612-622]	Dynamic Equilibrium
26/W	May 25	Lecture	14 [622-631]	Equilibrium Constants
27/F	May 27	Lecture	14 [631-640]	Equilibrium Concentration

**Week 10**

Meeting/Day	Date	Activity	Chapter/Reading*	Topics Covered
28/M	May 30	<b>Holiday</b>	none	
29/W	Jun 1	Lecture	14 [641-648]	Le Chatelier's Principle
30/F	Jun 3	Review	<b>5-6, 11-14</b>	

**Final Exam**

Day	Date	Time	Activity	Topics Covered
Tuesday	June 7 <sup>th</sup> 2011	8:00 am – 9:50 am	Final Exam	Chap 5-6, 11-14

**Disclaimer:** As the instructor of this course, I reserve the right to change the schedule, topics, number and length of examination, point distribution, course requirements, and percentages required for letter grades in order to better facilitate the learning process.

### **Non-graded Homework Problems:**

- (1) For each chapter, you should complete the “For Practice” and “For More Practice” problems
- (2) For each chapter, solve the odd numbered questions under the title “Problems by Topic” and “Cumulative Problems”

### **Graded Homework Problems**

Graded homework will be managed online through Mastering Chemistry. Assigned questions **may or may not include hints**. Level of difficulty of assigned problems will vary and may not directly relate to problems solved in lecture. You are responsible for making sure that you keep up with the various level of difficulty on the assigned homework problems.