

Chem 7: Principles of Chemistry II
Dr. Ryan Z. Hinrichs
Spring 2011

- Meeting Time: M/W/F 9:25 – 10:30 am (Section 002, in HS-244)
- Instructor: Dr. Ryan Z. Hinrichs
Office: S-210
rhinrich@drew.edu
Phone: 973.408.3853
- Office Hours: Tuesday 10:00-11:00 am or by appointment.
Open door policy: if my door is open, stop by.
- Optional Problem Solving Sessions: Friday 12:00-1:00 (in S-142)
- Required Materials: *Chemistry: The Molecular Science*, 4th or 3rd Ed.; Moore, Stanitski, Jurs.
OWL account for *Chemistry: The Molecular Science*, **4th Edition only**
Scientific Calculator
Laptop computer with Excel
Active email account and access to Course folder on Drew network
- Lab Materials: Laboratory Manual (provided in your first lab)
Laboratory notebook (partially used Chem 6L notebook is ok)
Goggles (replacement goggles may be purchased in the stockroom: \$10)

Course Objectives:

1. Learn the fundamental concepts and quantitative models describing chemical reactions.
 - predict if a reaction will happen (***thermodynamics***)
 - predict how fast a reaction will be (***kinetics***)
 - predict where a reaction will stop (***equilibrium***)
 - describe the factors that control thermodynamics, kinetics and equilibrium
 - apply these concepts to acid-base and oxidation-reduction reactions
 - apply the concepts learned in class to laboratory experiments
2. Learn to think like a scientist – after all, science is a process, not just a body of knowledge.
 - grow analytical skills, including critical thinking, data analysis, and problem solving
 - grow communication and collaboration skills, including team work, time-management and self-assessment

How to Succeed in Chemistry 7

Review the material covered in class that night. Review the team activity data and questions, along with the lecture slides and your lecture notes the same night of class. Ask yourself, how did today's class relate to the other topics already covered? If you have any questions, write them down so you can ask before or during the next class.

Read your text early and often. Your chemistry text needs to be read differently than most other material. Sitting back in a chair and skimming over a chapter, the way you might read a novel, is a guarantee for failure! You need to be actively engaged as you read. This means, for example, making sure that you understand the logic used to explain more complex phenomena using basic concepts, or being able to close the book and work through, on your own, a sample problem. Chemistry texts must be "read" with pencil and paper in hand. Don't highlight – take notes. It is important to read the text several times.

Work many problems. The goal of problem solving is not to memorize solutions to some standard problems, but rather to develop a flexible approach to solve novel and previously unfamiliar problems based on the application of a small number of important concepts and principles. Work in-text sample problems with the book closed. Then solve the recommended homework problems assigned for each topic. You may also want to work additional end-of-chapter problems that have the answers in the Appendix.

Don't go it alone! Whether chemistry ends up being a frustrating experience or an invigorating one depends in large part on how you approach it. To minimize the frustration and maximize the invigoration, I encourage collaboration of students outside the classroom. Bouncing ideas and explanations off friends is a powerful way to learn. Take turns explaining chemical situations to one another in your own words. Teach each other out loud – the best way to find out if you really understand a concept is to try to make someone else understand it.

***The above activities should take you at least THREE HOURS PER CLASS;
please schedule your time appropriately.***

HELP! HELP!

Chemistry is a challenging and demanding subject, especially the quantitative concepts covered during the Fall semester. If you feel lost, seek help immediately.

- Send me an email ASAP (rhinrich@drew.edu).
- Stop by my office. I have an open door policy – if I'm free, let's talk. Stopping by during office hours guarantees I'll be free.
- Attend optional problem solving sessions:

**Optional Problem Solving Sessions:
Friday 12:00-1:00 pm
in Hall of Sciences S-142**

Evaluation:

Attendance: 25 points. Because participation is central to active learning, I view **class attendance as mandatory**. You may miss two classes, for whatever reason, and still receive the full 25 point. Each additional absence beyond this will reduce your attendance grade by 5 points. If you miss class, it is your responsibility to get class notes from a friend. Course handouts will be posted on Moodle.

Quizzes: 50 points total; approximately 5 points per quiz. Approximately once a week, class will begin with a brief (10 minute) quiz. There will be eleven quizzes given during the semester. The lowest quiz score will be dropped. **The will be no make-up quizzes**; if you are absent or arrive late, you will receive a zero.

Homework: 100 points. Graded homework will be completed through the OWL online system. The web interactive homework for the week will be available on Monday. The due date will always be at 11:59 pm on the following Sunday. This means you have one week to complete each OWL assignment. Because your two lowest OWL grades will be dropped, there will be NO make-ups due to missed deadlines or technical problems. Extensions can be granted for truly exceptional extenuating circumstances

Exams: 300 points total; 100 points per exam. Dates of the in-class exams are listed on the course calendar. There will be **no make-up exams** except in cases of severe illness or family emergency. You must contact me within 24 hours of the scheduled exam time to reschedule; failure to do so will result in a zero for that exam.

Cumulative Final: 200 points total. The final exam will include all topics covered this semester. The date for the final exam will be posted by the Registrar.

Do you account for improvement when determining my Overall Grade?

Initially, each midterm exam will contribute 100 points each and the cumulative final will contribute 200 points towards your final grade. However, if you perform poorly on one of your midterms, you will have the opportunity to improve your grade by doing well on the final exam. If you score better on the final than on a mid-term, then the final exam will count as 250 points and your lowest mid-term exam will count as 50 points.

Lab Grade: 225 points total. You must be enrolled in a laboratory section (Chem 7L). Your lab instructor will provide me your final lab grade, which will be scaled to 225 points.

Optional Problem Solving Sessions: you will receive 1 bonus point for each week you attend.

Overall Grade:

In summary, grades for this course will be determined by the following criteria:

Homework Problems	100
Attendance & Quizzes	75
3 Exams (100 pt ea.)	300
Cumulative Final	200
Lab grade	225
Total	900

Letter grades will be determined by the following percentages:

90-100%	A range	(mastery of course material)
80-89%	B range	(very good understanding of the concepts)
70-79%	C range	(sufficient understanding of major concepts)
60-69%	D range	(memorized facts from class notes)
0-59%F		(insufficient effort/performance)

Exam Policies:

1. No cell phones (or other electronic devices except a calculator), papers, textbooks, or other written or personal materials (including personal periodic tables) may be taken to your seats during exams. These must be left at the front of the classroom. Possession of these during an exam will be considered a violation. These materials may also not be used during quizzes; please keep them under your desk during quizzes.
2. The misuse of programmable calculators and will not be permitted during exams. Misuse includes (but is not limited to) viewing preprogrammed equations, concepts or rules pertinent to the exam material. You may not recall anything from the memory of your calculator with the exception of the quadratic formula.
3. Students coming late to exams will not receive any extra time to complete their work.
4. Students absent from an exam will not be able to make it up (and will receive a zero on the exam) unless the absence is a consequence of serious illness or family emergency, which must be documented. You must contact me within 24 hours of the scheduled exam if such an unfortunate circumstance arises. Failure to contact me within 24 hours will result in a zero for that exam.
5. You are expected to abide by the Drew University Standards of Academic Integrity. Plagiarism (deliberate or unintentional) or cheating on quizzes or exams is unacceptable. Violations will be referred to the Academics Integrity Committee. For the official policy go to: <https://depts.drew.edu/cladean/drewonly/Academic%20Integrity%20Booklet2.htm#standardsacadinteg>

Academic Accommodations:

Should you require academic accommodations, you must file a request with the Office of Educational Affairs (BC 114, extension 3327). It is your responsibility to self-identify with the Office of Educational Affairs and to provide me with the appropriate documentation from that office at least one week prior to any request for specific course accommodations. There are no retroactive accommodations.

Course Name: CHEM 7 - Hinrichs
Instructor Name: Dr. Ryan Hinrichs

First assignment due
Sunday, January 30!

You need an OWL access code:

Option # 1: Purchase OWL access card + textbook at the Drew bookstore.

Option # 2: Purchase OWL access code online from www.cengage.com/owl. Choose your course ('General Chemistry'), and then click 'Buy an Access Code'. Choose the correct book (Chemistry: The Molecular Science, 4th Edition: Moore, Stanitski, Jurs) and term (6 months) and then you'll be taken to www.cengagebrain.com to complete your online purchase.

Technical Support: For help with registration, login, or other go to www.cengage.com/owl. From the top menu bar choose 'Students' and then 'Access Code Guide' or 'Getting Started'.

These documents are also posted on our course Moodle page.

Registration Instructions:

1. Go to <http://www.cengage.com/owl> and choose your course (General Chemistry) from this red box, and then choose **Register**.
2. On the next page, choose your textbook. Be sure to select the exact title, author(s), and edition that your instructor has chosen. (Chemistry: The Molecular Science, 4th Edition: Moore, Stanitski, Jurs) **You should choose the 4th edition whether you purchased the 4th edition or the 3rd edition!!**
3. On the next pages, choose your school (Drew University), and then click the blue arrow under Student **Registration**. (If you do not see the correct course and section names of the class you are taking, go back to step 1 and make sure you chose the correct textbook and school. If you still don't see your course, tell your instructor.)
4. Choose your course and section. Make sure you choose **CHEM 7 - Hinrichs** and not another instructor, otherwise I will not see your work or get your grades.** (see note at bottom of page) If you don't see the correct course and section names of the class you are taking, go back to steps 1-3 and make sure you chose the correct textbook and school. If you still don't see your course, tell your instructor.
5. Enter your information in the Self Registration Form. Enter your access code and click **Continue** to complete the registration process.

Login Instructions:

6. After you see the Successful Registration confirmation, click **Login Page** at the top of the screen.
7. When you see the Login page below, bookmark it for future visits to OWL. Here you'll enter the login name and password you chose during registration.

**If you have registered for the wrong section, you can login, and choose Add/Switch Course from the navigation bar at the left.

	Monday	Wednesday	Friday
1	Jan. 24 Syllabus What makes a reaction spontaneous?	Jan. 26 Chapter 11 At what temperatures do molecules boil?	Jan. 28 Chapter 11 When is a phase transition spontaneous?
2	Jan. 31 Chapter 15 When is a salt soluble?	Feb. 2 Chapter 18 How can we understand entropy?	Feb. 4 Chapter 18 How can we calculate entropy?
3	Feb. 7 Chapter 18 How can we calculate entropy?	Feb. 9 Chapter 18 Why is Gibbs Free Energy so useful?	Feb. 11 Chapter 13 How long will this reaction take? Are we there yet?
4	Feb. 14 Chapter 13 Rate Laws: How does concentration affect rates?	Feb. 16 Chapter 13 How do concentrations vary w/ time? Integrated rate laws.	Feb. 18 EXAM 1 <i>Chapters 11, 13, 18</i>
5	Feb. 21 Chapter 13 How do concentrations vary w/ time? Integrated rate laws.	Feb. 23 Chapter 13 How do rates vary with temperature?	Feb. 25 Chapter 13 Molecular depiction of reactions: mechanisms.
6	Feb. 28 Chapter 13 Molecular depiction of reactions: catalysis.	Mar. 2 Chapter 14 Where do reactions stop? Equilibrium intro.	Mar. 4 Chapter 14 Where do reactions stop? Equilibrium expressions.
	Mar. 7 Spring Break	Mar. 9 Spring Break	Mar. 11 Spring Break
7	Mar. 14 Chapter 14 How can we tell if a reaction is at equilibrium?	Mar. 16 Chapter 18 How are Gibbs Free Energy and equilibrium related?	Mar. 18 Chapter 14 Using equilibrium constants: Le Châtelier's Principle
8	Mar. 21 Chapter 13/14 Kinetics vs. Thermodynamics	Mar. 23 Chapter 16 Acid-base equilibrium and conjugate pairs	Mar. 25 EXAM 2 <i>Chapters 13, 14</i>
9	Mar. 28 Chapter 16 Strong vs. Weak	Mar. 30 Chapter 16 How much do weak acids dissociate?	Apr. 1 Chapter 16 How does structure affect acid strength?
10	Apr. 4 Chapter 16 Can ions be acids or bases?	Apr. 6 Chapter 16 Acid-Base Applications	Apr. 8 Chapter 17 How do you keep pH stable? Buffers
11	Apr. 11 Chapter 17 How do you keep pH stable? Buffers	Apr. 13 Chapter 17 Why is NaCl soluble while AgCl is not?	Apr. 15 Chapter 17 What controls solubility equilibria?
12	Apr. 18 Chapter 20 How do you know if you lost an electron?	Apr. 20 EXAM 3 <i>Chapters 16, 17</i>	Apr. 22 Good Friday
13	Apr. 25 Chapter 20 When is a redox reaction spontaneous?	Apr. 27 Chapter 20 When is a redox reaction spontaneous?	Apr. 29 Chapter 20 How does concentration affect cell voltage?
14	May 2 – "Friday Class" Review	May 4	May 6