

**Chem 6: Principles of Chemistry I**  
**Ryan Z. Hinrichs, Ph.D.**  
**Fall 2011**

- Meeting Time: M/W/F 9:25 – 10:30 am (Section 001, in HS-4)
- Instructor: Ryan Z. Hinrichs  
Office: S-210  
rhinrich@drew.edu  
Phone: 973.408.3853
- Office Hours: Tuesday 10:00-11:00 am; Wednesday 3:00-4:00 pm  
Or by appointment. Open door policy: if my door is open, stop by.
- Required Materials: *Chemistry: The Molecular Science*, 4<sup>th</sup> Ed., by Moore, Stanitski, and Jurs.  
Scientific Calculator  
Laptop computer with Excel  
Active email account and access to Course folder on Drew network
- Lab Materials: Laboratory Manual  
Laboratory notebook  
Goggles and lab coat
- 

Student Learning Outcomes:

1. Learn the fundamental concepts and quantitative models describing chemical reactions.
  - predict and describe the **structure of atoms**
  - predict and describe the **structure and properties of molecules/compounds**
  - describe and **quantify** changes associated with **chemical 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

To achieve these outcomes, each class will consist of lectures, collaborative activities, and follow-up discussions. Collaborative team activities involve working in groups of two or three to engage with experimental data and discuss their underlying patterns. *Effective team learning requires active and focused discussions involving all members of your group.* Discussion of the activity will occur both in class and after class on the Moodle course site.

## How to Succeed in Chemistry 6

**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.

## **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 usually 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 6L). 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        |
| <b>Total</b>         | <b>900</b> |

Letter grades will be determined by the following percentages:

|                |                |  |
|----------------|----------------|--|
| <b>90-100%</b> | <b>A range</b> | (mastery of course material)                 |
| <b>80-89%</b>  | <b>B range</b> | (very good understanding of the concepts)    |
| <b>70-79%</b>  | <b>C range</b> | (sufficient understanding of major concepts) |
| <b>60-69%</b>  | <b>D range</b> | (memorized the facts from class notes)       |
| <b>0-59%</b>   | <b>F</b>       | (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 6 - Hinrichs  
Instructor Name: Dr. Ryan Hinrichs

First assignment due  
Tuesday, September 6!

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](http://www.cengage.com/owl). Choose your course ('General Chemistry'), and then click 'Buy an Access Code'. Choose the correct book (Chemistry: The Molecular Science, 4<sup>th</sup> Edition: Moore, Stanitski, Jurs) and term (24 months) and then you'll be taken to [www.cengagebrain.com](http://www.cengagebrain.com) to complete your online purchase.

Technical Support: For help with registration, login, or other go to [www.cengage.com/owl](http://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, 4<sup>th</sup> Edition: Moore, Stanitski, Jurs)
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 6 - 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.*

### Tentative CHEM 6 Course Schedule

|    | <b>Monday</b>  | <b>Wednesday</b>   | <b>Friday</b>   |
|----|--|--|---|
| 1  | Aug. 29<br>Hurricane Irene   | Aug. 31<br>What's inside an atom?<br>Chapter 1, 2.1-2.4                        | Sept. 2<br>Why are units important?<br>Chapter 2.8-2.9                              |
| 2  | Sept. 5<br>No Class  | Sept. 7<br>How do we count atoms?<br>Chapter 2.5-2.7, 5.6                      | Sept. 9<br>What holds atoms together?<br>Chapter 6.1, 7.1                           |
| 3  | Sept. 12 (Last day to drop w/o W)<br>How attractive is the "core"?<br>Chapter 7.2-7.3  | Sept. 14<br>How do we study atoms?<br>Chapter 7.4-7.5                          | Sept. 16<br>How are electrons configured?<br>Chapter 7.7-7.12                       |
| 4  | Sept. 19<br>How are electrons configured?<br>Chapter 7.7-7.12                          | Sept. 21<br>Where are the electrons?<br>Chapter 7.4-7.6                        | Sept. 23<br><b>Exam 1</b><br><i>Chapters 1, 2, 7</i>                                |
| 5  | Sept. 26<br>How do we count molecules?<br>Chapter 7.13, 3.1-3.7                        | Sept. 28<br>Why do compounds form?<br>Chapter 3.8-3.10                         | Sept. 30<br>Why do compounds form?<br>Chapters 3 & 8                                |
| 6  | Oct. 3<br>How do molecules form?<br>Chapter 8.1-8.5                                    | Oct. 5<br>How do molecules form?<br>Chapter 8.6-8.8                            | Oct. 7<br>What is resonance?<br>Chapter 8.9-8.12                                    |
| 7  | Oct. 10<br>Reading day   | Oct. 12 (Monday classes meet)<br>What shapes are molecules?<br>Chapter 9.1-9.2 | Oct. 14<br>How do we predict shapes?<br>Chapter 9.1-9.2                             |
| 8  | Oct. 17<br>What do bonds look like?<br>Chapter 9.3-9.4                                 | Oct. 19<br>Why are reactions balanced?<br>Chapter 4.1-4.3                      | Oct. 21<br><b>Exam 2</b><br><i>Chapters 3, 8, 9</i>                                 |
| 9  | Oct. 24<br>What is enthalpy?<br>Chapter 6.1-6.5  | Oct. 26<br>What reactions release heat?<br>Chapter 6.6-6.10                    | Oct. 28<br>How do we predict heat release?<br>Chapter 6.11-6.12                     |
| 10 | Oct. 31<br>How many of each chemical react?<br>Chapter 4.4                             | Nov. 2<br>How many of each chemical react?<br>Chapter 4.4                      | Nov. 4 (Last day to drop w/ W)<br>What happens when you run out?<br>Chapter 4.5-4.7 |
| 11 | Nov. 7<br>What happens when you run out?<br>Chapter 4.5-4.7                            | Nov. 9<br>What types of reactions are there?<br>Chapter 5.1-5.2                | Nov. 11<br>How do we measure wet reactions?<br>Chapter 5.7-5.8                      |
| 12 | Nov. 14<br>What is enthalpy?<br>Chapter 6.1-6.5  | Nov. 16<br>What reactions release heat?<br>Chapter 6.6-6.10                    | Nov. 18<br>How do we predict heat release?<br>Chapter 6.11-6.12                     |
| 13 | Nov. 21<br><b>Exam 3</b><br><i>Chapters 4, 5, 6</i>                                    | Nov. 23<br>Thanksgiving  | Nov. 25<br>Thanksgiving   |
| 14 | Nov. 28<br>Do adjacent molecules interact?<br>Chapter 9.6-9.7                          | Nov. 30<br>When does a compound boil?<br>Chapter 9.6-9.7                       | Dec. 2<br>Are all gases the same?<br>Chapter 10.1-10.4                              |
| 15 | Dec. 5 (Wednesday classes meet)<br>How fast are molecules moving?<br>Chapter 10.5-10.6 | Dec. 7<br>Reading day  | Dec. 9<br>Reading day   |