

CHEMISTRY 111

Principles of Chemistry I

Fall 2008

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Class Meetings: MWF 1:30 pm – 2:45 pm; MLH 100

Laboratory: Section I: Mon 3-6 pm, MLH 240

Section II: Wed 3-6 pm, MLH 240

Section III: Fri 3-6 pm, MLH 240

Office Hours: M 10-11 W 11-12 Th 10-12 F 11-1 (Others by appointment)

I do hope you will visit during my office hours. Come individually or with friends. It's a chance to talk about the course, assignments, exams, study strategies, or whatever else you'd like to discuss. You don't have to have a *problem* to visit. If you find yourself having difficulty with understanding the course material or the homework, however, I definitely want to see you; hopefully I will be able to help. If these office hours are impossible for you, please let me know so that we can make an appointment for another time.

Texts:

1) *Chemistry, A Molecular Approach* by Tro, 1st Edition.

(Also available as an e-text from *coursesmart.com*)

I chose this book because of the author's clear writing style, its great illustrations, its step-by-step explanations on how to solve chemistry questions, and its excellent companion on-line homework program. It gives outstanding everyday examples of why chemistry is important, and why knowing something about chemistry enriches your understanding of the world we live in.

2) *Guided Inquiry Experiments for General Chemistry: Practical Problems and Application* by Kerner and Lamba, 1st Edition.

I chose this lab manual because it's the first lab manual I've seen that actually tries to emulate the way laboratory chemistry is done in the real world. Historically, most General Chemistry lab experiments have had a clear and expected "right" answer that you are supposed to arrive at. These experiments are mostly designed to validate what you have learned in lecture. While these experiments are often very instructional, they don't reflect the real world. Science is all about proposing *hypotheses* to either explain our observations of the real world, solve a problem, or develop an application for fundamental knowledge. These hypotheses are then tested by performing *experiments*. The results of our experiments are then used to either support or negate our hypothesis. Science in the real world is most often done in teams, and frequently with team members of differing expertise and talents. This lab manual attempts to emulate this process in the General Chemistry lab, and to have a little fun while doing so. I hope you enjoy it.

Other Needs: * *Mastering General Chemistry* Student Access Kit (included with *Tro*, or purchased separately if your text is used or e-text)

* Scientific calculator

* Safety goggles

What is this Course About?

Chemistry is the science of matter and its transformations. The behaviors of substances we observe in the *macroscopic* world are all explained by their properties found in the *microscopic* world. That is, the properties of the *atoms and molecules* of a substance determine everything about it, including its color, physical state, how it interacts with other substances, its safety or toxicity. Chemistry provides fundamental answers as to why our physical world is the way it is.

CHEM 111 is the first semester of a two semester general chemistry sequence. In this course, we cover a lot of nuts and bolts topics, and some more esoteric ones. Topics covered include:

Measurement basics: Much of chemistry involves measurements, and you will learn measurement skills that are important in chemistry, as well as all sciences.

Atoms and Molecules: You will learn how atoms are put together, and how atoms are put together to form molecules. There are several theories of chemical bonding that we'll look at. You'll also learn to determine the shapes of molecules, and see how molecular shape helps determine physical and chemical properties.

Chemical Reactions: You will learn about the basic types of chemical reactions and how to recognize them. You will also learn reaction "bookkeeping", where you'll learn about the mathematical relationships between reactants and products.

Energy Changes: You'll learn about the energy changes that accompany all chemical reactions and why this is important.

Periodic Trends: The heart of chemistry lies in the periodic chart of the elements. You'll learn about trends in reactivity among elements that are mapped out in the periodic chart.

***** COURSE SCHEDULE *****

DATES TOPICS CHAPTERS

8/25 – 9/24 Measurements, Problem Solving

 Atoms, Elements, and Ions 1, 2, 3, 4
 Molecules and Compounds

9/26 EXAM 1

9/29 – 10/22 Chemical Quantities, Types of Reactions

 Gases and the Gas Laws 4, 5, 6, 7
 Energy Changes in Chemical Reactions

10/24 EXAM 2

10/31 Last Day to Withdraw from Class

10/27 – 11/19 Electromagnetic Radiation

 Atomic Structure, Periodic Trends 7, 8, 9
 Chemical Bonding

11/21 EXAM 3

11/24-11/28 Thanksgiving Break

12/1-12/12 Molecular Shapes

 Valence Bond Theory 9, 10
 Molecular Orbital Theory

12/15 COMPREHENSIVE FINAL EXAM

What is the Laboratory About?

Chemistry is a laboratory based experimental science. To really get a feel for what chemists do, you need to experience more than lecture classes. You need to get involved in hands-on, minds-on chemistry problem solving and experiments. The place to do that is in the lab. While most of our lab experiments will come from the lab manual, you will perform a couple of the classic “traditional experiments”. Handouts will be provided for these.

***** LABORATORY SCHEDULE *****

WEEK BEGINNING EXPERIMENT

9/8.....1-1 How long can a bubble last?
9/15.....1-2 Are all pennies the same?
9/22.....Inorganic nomenclature (worksheet handout)
9/29.....2-1 How much hydrogen?
10/6.....2-2 How much is too much?
10/13.....4-1 What factors affect the solubility of ions?
10/20.....9-1 Acidic, Basic, or Neutral?
10/27.....Molar mass of an unknown acid (Handout: Acid-Base titration)
11/3.....3-1 What makes a solution colored or colorless?
11/10.....3-3 What factors affect color intensity?
11/17.....3-2 Are there property patterns?
11/24.....Thanksgiving
12/1.....Lab checkout/cleanup This is mandatory. Failure to participate in lab clean-up will result in a forfeiture of 50% of your lab points.
12/8.....No lab

Course Websites

Blackboard Website. This is the official course website. You may check your grades, find the syllabus posted, find practice exams, answer keys, and announcements. You will be responsible for all announcements posted on this site, so you should check it frequently. To access this page, you will first log on to Warrior Web, and then you can directly access this online portion of the class.

www.masteringchemistry.com This is the site for your web-based homework and tutorial program. Homework will be assigned to you, done by you, graded, and otherwise managed using this program. More details on the homework are given below.

General Information:

Lecture: Attendance at every lecture is mandatory. You should do the assigned reading for the day BEFORE coming to lecture. The lecture will emphasize theory and problem solving. We will also do small group problem solving activities. These will be conducted with groups of three or four students in a “base group” that you will self-organize. I will periodically ask students to assemble into their base groups for problem solving exercises. Please finalize your seating preference in the lecture hall by the beginning of the second week of class so that you can assemble your base group quickly. Group activities will involve students performing rotating duties of leading your group in discussions about how to solve problems.

If you miss a lecture, it is your responsibility to seek out material that was covered. Please don't expect me to re-create a day's lecture in my office if you missed.

Quizzes: There will be a quiz every Friday that we are not having an exam. The quiz is given at the end of class. These quizzes mostly contain problem-solving and short answer types of questions. The goal of having weekly quizzes is two-fold. First, weekly quizzes oblige you to stay current with the class material and keep on track. Second, weekly quizzes offer an excellent assessment of your progress throughout the semester, and provide an alternative (and sometimes better) indication of your understanding of the course material than exams do.

There will be 11 quizzes during the semester that are worth 20 points, covering material discussed in class and assigned homework problems. The two lowest scores of these eleven quizzes will be dropped when calculating your final course grade. There will also be an initial quiz on Friday, August 29 that asks questions about this syllabus. This quiz is worth 10 points. The goal of this initial quiz is simply to get you to read this syllabus. This quiz score will not be considered as a potential “dropped” quiz when your two lowest quiz scores are dropped in the final course grading.

Exams: There will be three exams during the semester each worth 100 points. There will be a variety of problem types including multiple choice, short answer/definition and problem solving. There will be a comprehensive final exam worth 150 points.

Laboratory: Most laboratory experiments will be conducted with you acting as part of a team consisting of two to four students, depending on the experiment. The experiments will require you to do a bit of “role playing” as a scientist in a scenario described to you at the beginning of the lab experiment. The experiments emphasize hypothesis testing, problem solving, teamwork, and applications of chemistry theory.

It is important that you **read the experiment before coming to lab**, so that you have an idea of what you will be doing. This will make the execution of the lab go much smoother for you and your team members.

Lab Reports: Each laboratory experiment will culminate in a lab report worth 20 points. The lab reports must be completed and handed in at the BEGINNING of the lab period that immediately follows the completion of the laboratory. The lab reports will mostly be written on forms that are provided in the lab manual, along with some attachments (graphs, etc...) that you create.

You must hand in your own lab report, unique from anyone else’s. Submitted lab reports that are copied in whole or in part from another person’s lab report will result in a grade of zero for that lab experiment for all parties involved. It is perfectly acceptable to collaborate on completing your lab reports, but all materials handed in will be scrutinized for identical lab reports.

Late lab assignments: The maximum value of lab reports will be reduced by 4 points (20%) for each day they are late. For example, a 20 point lab will be only worth 16 points if it is one day late. Point deductions for incorrect answers, etc... will be deducted from the new maximum value. If a lab is handed in five days late, its value will have decreased to zero points.

No Make-up Labs: If you miss a lab for any reason other than an institutional excuse or a death in your immediate family, you will receive a score of zero for that lab. **Failure to come to two or more labs will result in a failing grade for the course.**

Homework: Homework will be assigned to you, done by you, graded, and otherwise managed using the *Mastering Chemistry* online tutorial and homework program that accompanies the textbook. If you purchased a new text, a registration access code has been supplied to you along with the book. If you purchased a used book, you must purchase an access code online. Registration details are given on the last page of this syllabus.

The manner in which the program grades your homework may seem complex at first, but it will become easier to understand in a short time. Each homework item (1 point nominal value) typically contains multiple parts, and you will get six tries to answer each part correctly. Hints are often available for a small point price. You also receive bonus points for unopened hints. The program provides the complete grading details. Your final percent score for all of the assigned homework in the class will be applied towards the 200 possible homework points for the semester.

It is your responsibility to check the program to see the assignments and their due dates.

POINTS / GRADING

The available points in the class are as follows:

Quizzes (11 quizzes, best 9 @ 20 pts. each, plus one 10 pt. quiz)....	190 pts
Exams (3 @ 100 points each).....	300 pts
Final Examination.....	150 pts
Laboratory Experiments (11 @ 20 pts. each).....	220 pts
Homework.....	<u>200 pts</u>

Total Points Available 1060 pts

Final grades will be assigned according to the following percent accumulation of the above available points:

A 100 - 90% A- 89 - 88%

B+ 87 - 86% B 85 - 78% B- 77 - 76%

C+ 75 - 74% C 73 - 65% C- 65 - 64%

D+ 63 - 60% D 59 - 50%

F <50%

Grade Record Keeping

You will be able to view your grades on the course website as the semester progresses, and to keep track of your grade. If you see a mistake in the gradebook, please notify me by email, and present the quiz, exam, or lab report in question to me in person.

It is important that you keep all graded materials that have been returned to you in an organized fashion. I suggest one folder for lab reports, one for quizzes, and one for exams. This will help you correct any mistakes in the gradebook, and provide easy access for you to these materials when it is time to study for exams and the final.

Access and Accommodation:

If you feel there is any physical, emotional, or mental challenge to you that impedes your ability to participate in the class, please see me so we can address the issue. If you have any special medical needs if the building had to be quickly evacuated, also please inform me. Assistance with accommodation can be found at the Office of Student Life, Room 111, Reid Centennial Hall.

Academic Honesty:

Our course is an academic community that is bound together by the traditions and practice of scholarship. Honest intellectual work - on exams, quizzes, and lab reports – is essential to the success of our own community of scholars. Using classmates' responses to answer questions on any of these assessments undermines the trust and respect on which our course depends.

The work in this course is challenging and will demand a good deal of each of you. I have every confidence that each of you can succeed. Doing your own work will enhance your sense of accomplishment when the semester comes to a close.

Any form of academic dishonesty will result in an "F" for the course and referral to the Dean of Academic Affairs (see LCSC Student Handbook). As defined in the LCSC Student Handbook at www.lcsc.edu/student-services/StudentHandbook.htm (code of conduct), Academic Dishonesty is any of the following:

Cheating- intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise. The term academic exercise includes all forms of work submitted for credit hours.

Fabrication- intentional and/or unauthorized falsification or invention of any information or the source of any information in an academic exercise.

Collusion- facilitating academic dishonesty- intentionally or knowingly helping or attempting to help another to commit an act of Academic Dishonesty.

Plagiarism- the deliberate adoption or reproduction of ideas or words or statements of another person as one's own without acknowledgment.

How to Succeed in This Class

Get prepared. Stay prepared.

Don't fall behind. Study 2 hours for every hour in class.

Read the book in advance of lecture topics.

Do your homework on time.

Hand in your Lab assignments on time

Ask questions. Interrupt me in class if you don't understand what I'm saying.

Get help if you don't understand something. Help is available at office hours and at the Math and Science help center.

Dear Student:

In this course you will be using MasteringChemistry™, an online tutorial and homework companion to your textbook.

What You Need:

A valid email address

A student access code (Comes in the Student Access Kit packaged with your new textbook. Otherwise, you can purchase access online at www.masteringchemistry.com.)

The zip code for your school: 83501

A Course ID: CHEM111FALL08

Student Registration

Go to www.masteringchemistry.com. If asked to identify your text, select the title and edition of your course textbook.

Click **Register** to register for MasteringChemistry with your student access code. (*Don't have a new access code?* You can purchase access by clicking Buy Now. Your purchase path will differ slightly from the registration instructions that follow.)

Agree to the **License Agreement** and **Privacy Policy** by clicking the checkboxes.

Leave "**No, I am a New User**" selected, then type in your **Access Code** in the fields provided. (Enter one "word" per box, without the dashes.)

Enter your **School Zip Code**, select your **Country** and click **Next**.

Enter your **Name** and **Email** and select **Your School**.

Create a personal **Login Name** and **Password**, answer the **Security Question** and click **Next**.

Upon completion, the **Confirmation & Summary** page confirms your registration information. This information will also be emailed to you for your records.

Enroll in Your Instructor's Course and/or Access Self-Study Area

If you receive a Course ID from your instructor, you will use this to "enroll" in your instructor's MasteringChemistry online course so that you can be included in his or her gradebook. If you don't receive a Course ID, you may still be able to access self-study resources.

Go to www.masteringchemistry.com. If asked to identify your text, select the title and edition of your course textbook.

Under **Returning User?**, enter the login name and password you created, then click **Log In**.

Either enter your instructor's MasteringChemistry **Course ID** or click **Proceed to Self-Study Area** (if an independent self-study option is available for your textbook). Your instructor *may* also request that you enter a special Student ID for this course, either now or later. If so, be sure to enter this information EXACTLY as your professor has instructed.

Congratulations! You have completed registration and have enrolled in your MasteringChemistry course.

To access your course from now on: Simply go to www.masteringchemistry.com, select your textbook if prompted, and enter your login name and password.

System Requirements & Support

To effectively use the resources on this website, check its system requirements: Log in to www.masteringchemistry.com and click the "System requirements" link at the bottom of the home page. In particular, you may need to check that the latest version of the Flash player is available to your browser.

Customer Technical Support: <http://www.masteringsupport.com>