INTRODUCTION TO CHEMICAL PRINCIPLES (CHM 104-30630)
MTWR  8:00-9:35 AM
Summer 2010

INSTRUCTOR’S INFORMATION
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Mailing Address: Chemistry Department
                Oakland University, Rochester, MI48309-4477
Office Hours: Before or after class or by appointment. Feel free to e-mail me at anytime.

CATALOG COURSE DESCRIPTION
Study of principles of general chemistry. Prepares students for CHM 201. Recommended preparation: high school algebra and chemistry. Satisfies the university general education requirement in the natural science and technology knowledge exploration area. Prerequisite: MTH 011 with a minimum grade of 2.0 or placement in MTH 012; or CHM 090.

COURSE DESCRIPTION
CHM 104 (4 credits) is the first semester of a one-year course in general, organic and biological chemistry. The topics covered are matter, energy, chemical formulas, measurements, metric system, periodic table, atomic theory and structure, bonding, chemical reactions and equations, stoichiometry, solutions, acid/base theories, equilibrium, gas laws, and nuclear chemistry. This course is intended for the student who needs fundamental college chemistry, or those students who need preparation for CHM 201. This course is not intended for chemistry majors, premed, etc.

COURSE GOALS AND OBJECTIVES
CHM 104 satisfies the university general education requirement in natural science and technology (NST). The learning outcomes for NST courses state that the student will demonstrate:

- Knowledge of major concepts from natural science or technology, including developing and testing of hypotheses; drawing conclusions; and reporting of findings through some laboratory experience or an effective substitute (Laboratory experiences are met by either a limited number of interactive experiences, collecting and interpreting raw data, or other effective experiences such as a virtual laboratory)
- How to evaluate sources of information in science or technology

Learning Outcomes
You will also be able to perform the following:

1. Solve problems involving direct proportionality
2. Use both English and Metric units of measure
3. Use the periodic table to predict bonding and molecular geometry
4. Organize, balance and predict products for chemical equations
5. Understand differences among solids, liquids and gases and the forces holding them together
6. Solve problems related to all Gas Laws
7. Solve problems related to molar ratios
8. Determine the correct electron configuration of an atomic species.
10. Name various ionic and covalent compounds
11. Identify the various types of chemical reactions; predict reaction rates, equilibrium and pH
12. Predict products of nuclear reactions
13. Perform experiments that apply knowledge above.

The **crosscutting capacity** covered is **critical thinking**.

**TEXT:** General Organic and Biological Chemistry 6th edition, w/ media, McMurry, Castellion and Ballantine, Pearson/Prentice Hall. The pace will be one chapter of text per week. **DO NOT FALL BEHIND!**


**CHAPTERS:** We will be covering eleven chapters at a pace of one chapter per week in the following order: Chapter 1 (Matter, Energy, and Life), chapter 2 (Measurements in chemistry), chapter 3 (Atoms and the periodic table), chapter 4 (Ionic compounds), chapter 5 (Molecular compounds), chapter 6 (Chemical reactions: Mass relationships and classification), chapter 7 (Chemical reactions: Energy, rates, and equilibrium), chapter 8 (Gases, Liquids, and Solids), chapter 9 (Solutions), chapter 10 (Acids, bases, and salts), and chapter 11 (Nuclear chemistry).

**LABORATORY:** CHM 104 Lab Manual Course Pack (4 labs). Three labs are graded out of 25 points each and a safety lab graded 15 points. A total of 90 points.

**QUIZZES:** Eleven quizzes will be given throughout the course. Each quiz is worth 5 points. Please refer to Mastering Chemistry for the quiz assignments and their due dates.

**HOMEWORK:** Eleven homework assignments will be given throughout the course. Each homework is worth 5 points. Please refer to Mastering Chemistry for the homework assignments and their due dates.

**STYLE OF COURSE:** Given the size of the class, lecturing will predominate. I won’t lecture about everything in the text. Rather, lectures will focus on the main themes of each chapter. Nevertheless, you are responsible for everything in the lectures and in the text (except for a few exclusions that will be listed as I go along). Power point slides for all lectures are also available via Mastering Chemistry website, under student resources. It is your choice not to attend classes but you are responsible for all the materials discussed during classes.

**DISCUSSION BOARD:** The discussion board on Moodle is specifically designated to discuss any topic related to this class. I will closely monitor everything posted. I also encourage all of you to answer questions and concerns of the others, if you know the answer. If you need to discuss any private matter and do not wish to share it with your
classmates please use the email specifically designated for this class on Moodle. Please do not use my saed@oakland.edu email. I will not answer it.

EXAMS AND GRADING
Grades are based on scores collected from all exams, Labs, quizzes and homework assignments. Exam I will cover chapters 1-3, exam II will cover chapters 4-6, and exam III will cover chapters 7-9. The final exam is comprehensive American Chemical Society (ACS) exam, which will cover all chapters. Examinations are based on material covered in the textbook. Exams will consist of multiple-choice questions.

The graded work will be:

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
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<tbody>
<tr>
<td>Exams</td>
<td>300 (100 each)</td>
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<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
<tr>
<td>Homework assignments</td>
<td>55 (5 each)</td>
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<tr>
<td>Quiz assignments</td>
<td>55 (5 each)</td>
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<tr>
<td>Laboratory</td>
<td>90</td>
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The maximum number of points that any student can accumulate is 600 points. Final numeric grades will be based on the highest score in the class, which will be assigned a 4.0 grade. Grades will be calculated using the following formula: student’s total points divided by the highest number of points earned out of the whole class multiplied by 4. Obviously, the highest number of points cannot be determined until the end of the semester. To monitor your progress in the class, please use the highest number of points possible for each exam.

Scantron forms F-1712-PAR-L are required for all exams. Scantron forms are available at the Book Store (Student Congress may offer them for free). Bring one and a pencil each EXAM. The grading machine is very accurate, but you won’t receive credit in the case of your poor erasure; therefore, work out your answers completely on the question sheet (which you may write on and keep), and, only then, transfer them to the answer sheet.

The only electronic device allowed is a calculator. The only calculators allowed are the TI-30X or TI-30X Solar scientific calculators. You may not have any cellular phone, radio/MP3 player, or other electronic device on your person. Please turn off cellular phone during exams. Once an exam begins, you will not be allowed to leave the room and return to complete your exam.

No Make-up exams are given. Should you miss an exam for non-legitimate reasons, you will receive a grade of zero on the missed examination. If you missed an exam for a legitimate reason, we can negotiate. You will receive ongoing grade feedback on Moodle; click on “Grades” in the left column. Grading disagreements should be submitted in writing. I will make a decision, based on the logic of your argument.

The University also asks us to record midterm grades on SAIL. They will be available about March 1, using S/U grading. If your grade at that point is below a 2.0, a U (Unsatisfactory) will be listed. If no grade is listed, assume an S (Satisfactory) grade. Final course grades, however, will be numerical. The Oakland grading system is: 3.6 to 4.0 = A, 3.0 to 3.5 = B, 2.0 to 2.9 = C, 1.0 to 1.9 = D, 0.0 = E.

ELECTRONIC AIDS: You must be able to access two different web sites.
**Moodle:** Our Moodle site is at: [http://moodle.oakland.edu](http://moodle.oakland.edu) and there is no class password; every class registrant is automatically in the system. Students have course access to Moodle one week before the semester starts. Note: Using Internet Explorer to access Moodle will generate errors. You must get the Firefox browser from a free download at [http://www.mozilla.com](http://www.mozilla.com). You must check Moodle for the latest news, announcements, class assignments, course syllabus, and grades.

**Mastering Chemistry:** Mastering Chemistry will be used for homework and quiz assignments. Click on Mastering Chemistry link on Moodle and register your self. Instructions of how to register are posted on Moodle under Mastering Chemistry login information.

**SUGGESTIONS FOR STUDYING:** Each semester some students come to me puzzled as to why they are not doing well. There are two main reasons. One group of students just isn't spending enough time studying. As a rule of thumb, expect to spend six hours per week per credit. A second group of students is putting in the time but still not getting the results. This results from following teacher and text too mechanically. Look at the material from a fresh and deeper perspective. You can't succeed by sheer memorization; you must also understand and be able to use the concepts.

**TIMETABLE**

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<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
<th>Title</th>
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<tbody>
<tr>
<td>May 3</td>
<td>1</td>
<td>Matter, Energy, and Life</td>
</tr>
<tr>
<td>May 4-5</td>
<td>2</td>
<td>Measurements in chemistry</td>
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<tr>
<td>May 6-10</td>
<td>3</td>
<td>Atoms and the periodic table</td>
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<td>May 11</td>
<td>Exam I</td>
<td>Chapters 1-3</td>
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<tr>
<td>May 12-13</td>
<td>4</td>
<td>Ionic compounds</td>
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<tr>
<td>May 17-18</td>
<td>5</td>
<td>Molecular compounds</td>
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<tr>
<td>May 19-20</td>
<td>6</td>
<td>Chemical reactions: Mass relationships and classification</td>
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<tr>
<td>May 24</td>
<td>Exam II</td>
<td>Chapters 4-6</td>
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<tr>
<td>May 25-26</td>
<td>7</td>
<td>Chemical reactions: Energy, rates, and equilibrium</td>
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<td>May 27- June 1</td>
<td>8</td>
<td>Gases, Liquids, and Solids</td>
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<td>June 2-7</td>
<td>9</td>
<td>Solutions</td>
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<td>June 8</td>
<td>Exam III</td>
<td>Chapters 7-9</td>
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<td>June 9-14</td>
<td>10</td>
<td>Acids, Bases, and Salts</td>
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<td>June 15-16</td>
<td>11</td>
<td>Nuclear chemistry</td>
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<td>June 17</td>
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<td>Review for Final Exam</td>
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<tr>
<td>April 22</td>
<td>Final Exam</td>
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*Final ACS comprehensive Exam will be held in HHS190 from 8:00 -11:00 am.*