CHM 104
Introduction to Chemical Principles
Winter 2008

Instructor: Jennifer Tillinger, Ph.D.  
Office: 347 HHS  
Phone: (248) 370-2883  
e-mail: jbulgare@oakland.edu

CRN: 15551  
Day & Time: TR 10:00 – 11:47 a.m.  
Room: 204 ODH  
Laboratory: 230/240 HHS

Office Hours:  
MW 2:00 – 3:00 p.m.,  
TR 12:00 – 1:00 p.m. or by appointment

REQUIRED:  
1. Textbook:  
   Fundamentals of General, Organic and Biological Chemistry, with MediaPak  
   John McMurry, Mary Castellion, and David Ballantine - 5th Edition

2. Lab Manual:  
   CHM 104 Lab Manual, Oakland University,

3. Other:  
iClicker (handheld electronic device), Scientific Calculator (no graphing calculators),  
Safety Glasses, and Scantron forms 882

RECOMMENDED:  
Fundamentals of General, Organic and Biological Chemistry Study Guide and Full  

TENTATIVE SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>Introduction, Ch. 1 Matter, Energy, and Life</td>
</tr>
<tr>
<td>1/10 – 1/17</td>
<td>Ch. 2 Measurements in Chemistry</td>
</tr>
</tbody>
</table>
| 1/28 | Lab #3 An Introduction to Volume and Mass  
& Lab #4 A Lesson in Density Part 3 & 4 (25 pt) |
| 1/22 – 1/29 | Ch. 3 Atoms and the Periodic Table |
| 1/31 | Exam I (Chapter 1-3) |
| 2/5 – 2/7 | Ch. 4 Ionic Compounds |
| 2/12 – 2/19 | Ch. 5 Molecular Compounds |
| 2/21 | Ch. 6 Chemical Reactions: Classification and Mass Relationship |
| 2/24 – 3/2 | Spring Break |
| 3/3 | Lab Molecular Modeling (25 pt) |
| 3/4 - 3/6 | Ch. 6 cont…. |
| 3/11 | Exam II (Chapter 4-6) |
| 3/13 – 3/18 | Ch. 7 Chemical Reactions: Energy, Rates, and Equilibrium |
| 3/20 – 3/27 | Ch. 8 Gases, Liquids, and Solids |
| 3/31 | Lab Properties of Liquids (25 pt) |
| 4/1 | Exam III (Chapter 7-8) |
| 4/3 – 4/8 | Ch. 9 Solutions |
| 4/10 – 4/15 | Ch. 10 Acids and Bases |
| 4/17 | Ch. 11 Nuclear Chemistry |
| 4/22 | Final Exam (Comprehensive) 8:00 – 11:00 a.m. |

March 17, 2008 is the last day for an Official Withdrawal.
Prerequisite – placement into MTH 012 or higher, 2.0 grade in MTH 011, or CHM 090
COURSE DESCRIPTION:

Chemistry 104 (CHM 104) 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 need fundamental college chemistry, or those students who need preparation for CHM 201. This course is not intended for chemistry majors, premed etc. This course satisfies the university General Education Requirement in Natural sciences and Technology.

Prerequisite MTH 011 with a minimum grade of 2.0 or placement in MTH 012 or higher

LEARNING OUTCOMES:

1. Demonstrate the ability to solve problems involving direct proportionality.
2. Take measurements and evaluate given data using both English and Metric units of measure.
3. Apply the concepts learned about the periodic table to predict types of bonding and molecular geometry. Naming of ionic and molecular compounds and their properties.
4. Organize, balance and predict products for some chemical equations qualitatively and quantitatively.
5. Predict how various factors will affect reaction rates, equilibrium and pH.
6. Understand at a molecular level the difference between a solid, liquid, and gas; and the types of forces holding them together.
7. Apply the concepts learned about gases to solve gas law problems.
8. Apply the concepts learned about solutions to predict solubilities and solve problems that involve making various types of solutions.
9. Identify an acid or a base, and calculate the pH of a solution.
10. Predict the products of a nuclear reaction.
11. Demonstrate the capability of performing physical chemical experiments that apply the knowledge learned in the above outcomes.

CLASS EXPECTATIONS:

1. Attendance:
   - Lecture: You are expected to attend each class although attendance is not taken. A small portion of your grade is from graded questions given throughout the lecture period using your iClicker. To receive any points you must be present in class.
   - Lab: The lab sessions listed in the schedule are mandatory. You are expected to attend your scheduled lab section. There will be no make-ups for missed laboratory periods. These are as scheduled (listed in the schedule of classes), so please do not miss and please be on time.

2. Homework:
   The suggested homework for this class is ALL the even problems at the end of each chapter, including Applications and General Questions and Problems, unless otherwise indicated. There are additional problems available through the MediaPak and/or Study Guide, and practice tests posted on Moodle. Homework will not be collected, but I strongly recommend for you to do all the homework. This is one of the best ways to become proficient in the material.

3. Laboratory:
   The lab will meet four (4) times during the semester. The dates are listed in the schedule of classes. Three labs will be submitted (25 point each) during the semester. Attendance is mandatory and NO make-up lab time will be given. Safety goggles MUST be worn at all times in the lab.

Laboratory Dates: All Mondays
4. Exams and In Class Assessment:
In class Assessment: Each student is required to purchase an iClicker which will be used during lecture. Throughout the lecture period graded multiple choice questions will be randomly given to the class. The students will respond to the question within the allotted time using their iClicker. Each student can receive up to two points per question asked. They will receive 1 point for answering the question, and 1 point for answering the question correctly. The questions asked can be from previously covered material, from material covered in lecture that day, or any definitions from the current chapter not yet discussed in lecture. Some questions may require you to do calculations, so you should bring your calculator and iClicker to class daily. The in class assessments points will be worth 12.5% of your total grade.

Exams: There will be three exams (100 points each) during the semester and a comprehensive final exam (150 points). You will need scantron form 882 for all exams. All exams will be given at the beginning of class. Please be prompt, or you may not have enough time. No make-up exams and no extra credit assignments will be given.

Exam Dates:
Exam I January 31st
Exam II March 11th
Exam III April 1st
Final Exam April 22nd

During exams the only electron device that is can be used is a non-graphing calculator. The use of cellular phones, radio/MP3 players with headsets, graphing calculators, or any other electronic device not approved by the instructor will not be allowed. Also, please no hats and turn off cellular phones during exams.

Once an exam begins, you will not be allowed to leave the room and return to complete your exam.

Cheating:
Students are expected to uphold the academic standards set by Oakland University. The work submitted by any student should be their own work. Students suspected of academic misconduct (Examples of academic misconduct are looking off another students exam, plagiarism, changing answers on your exam sheet after grading or lab reports, the use of materials not authorized by the instructor, obtaining copies of exam questions prior to the exam date, or another student taking an exam for you), will be reported to the academic conduct committee. Students found guilty of academic misconduct will receive a zero grade for the this course. For further details see Academic Conduct Policies section (p. 93 – 94) in the 2007 – 2008 Undergraduate Catalog.

5. Grading:
Final numeric grades will be determined as follows: A 90% of the maximum points will be assigned a 4.0 grade. A 50% score of the maximum points will be assigned a 1.0 grade, with a linear grade scale between. Students with points totaling less than 50% of the total points possible will receive a 0.0 grade.

- Your lowest exam grade may be replaced by your final exam percentage grade from the comprehensive final exam given at the end of the semester if you have shown improvement throughout the semester.
- No make-up tests will be given without advanced notice. If you know in the beginning of the semester that you have a conflict, you can make arrangements to take the exam early. ALL tests missed will be recorded as a zero.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Three exams (100 pt each)</td>
<td>50.0%</td>
</tr>
<tr>
<td>Three lab reports (25 pt each)</td>
<td>12.5%</td>
</tr>
<tr>
<td>In class assessment (iclicker)</td>
<td>12.5%</td>
</tr>
<tr>
<td>Comprehensive final exam (150 pt)</td>
<td>25.0%</td>
</tr>
<tr>
<td>Total Points</td>
<td>100%</td>
</tr>
</tbody>
</table>