I. Course Overview

A. Basic Information

Department: Chemistry
Course Prefixes: CHM 104, Section 40525
Course Title: Introduction to Chemical Principles
Credit Hours: 4

Class meets Tuesdays and Thursdays from 8:00 to 9:47 am in Room 190 HHS.

B. Instructor’s Information

Name: Ghassan M. Saed, Ph.D.
Office: Room 385, HHS
Mailbox: 264 SEB under name of Saed
E-mail Address: saed@oakland.edu
Office Fax number: (248) 370-2321
Mailing Address: Chemistry Department
Oakland University, Rochester, MI 48309-4477
Office Hours: Before or after class or by appointment. Feel free to e-mail me at anytime.

C. 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.

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 needs fundamental college chemistry, or those students who need preparation for CHM 201. This course is not intended for chemistry majors, premed, etc.

D. Required

Textbook: General Organic and Biological Chemistry 5th edition, w/ media, McMurry, Castellion and Ballantine, Pearson/Prentice Hall, 2007

CHM 104 Lab Manual Course Pack (3 labs)
Other: Scientific calculator, Safety glasses, Scantron forms 882


II. 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 cross-cutting capacity covered is critical thinking.

III. Class Expectations

A. Cell phones are to be turned off during class period. You may not leave the classroom to answer phone calls and return.

B. Web Site

There is a web site for this course at Moodle. You will be required to use the site to check for the latest news, announcements, class assignments, course syllabus, and grades. To login into Moodle, you will use your OU email I.D. and password.
C. Examinations

Examinations are based on material covered in class and in the textbook. All exams will consist of multiple-choice questions. Each of the four exams should take you no more than 80 minutes to complete.

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.

Tentative plan for the exams:

Exam 1 includes chapters 1, 2, and 3.
Exam 2 includes chapters 4, 5, and 6
Exam 3 includes chapters 7 and 8
Exam 4 includes chapters 9, 10, and 11

The only electronic device allowed is a calculator. 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.

D. Laboratory Experiences

You are required to register and attend three general education laboratory sessions during the semester, each worth 25 points.

Laboratory sessions:

1) An introduction to volume and mass measurements: A lesson in density

2) Molecular Modeling: Lewis structures, VSEPR & Molecular Polarity

3) Properties of Liquids

You will be working with a lab partner for each of the labs. Each lab has a group pre-lab assignment. You must read the experiment and complete the pre-lab assignment before entering the lab. If the pre-lab is not done, your group will receive a zero for that portion of the lab. One pre-lab and one lab report will be submitted per group. Lab reports are due at the beginning of the following class period. Labs turned in after that time will be late. A late lab report will lose 25% of the total for every 24-hour period it is late. No make-up labs will be given. Safety glasses must be worn at all times in the lab.

Group lab reports will be graded on the basis of the science of the work as well as on the quality of the writing, including spelling, grammar, punctuation, etc.
E. Grades

There will be four multiple-choice exams (No comprehensive final exam will be given), three labs and homework assignments. The due dates for these activities are shown in Time table.

The graded work will be:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four multiple-choice exams</td>
<td>100 each</td>
</tr>
<tr>
<td>Three labs</td>
<td>25 each</td>
</tr>
<tr>
<td>Eleven homework assignments</td>
<td>2 each</td>
</tr>
</tbody>
</table>

The maximum number of points that any student can accumulate is 497 points. Final numeric grades will be based on parameter H. A score of H or higher will be assigned a 4.0 grade. About half of the score will be assigned a 1.0 grade, with a linear grade scale in between. Students with total points less than about H/2 will receive a 0.0 grade. Personal grades are not available by e-mail but are available on Moodle.

F. Class Attendance

You are expected to attend each class and you are responsible for everything discussed in class, like changing exams dates and/or adding or omitting materials. The lab sessions listed in the time schedule are mandatory. There will be no make-ups for missed laboratory periods. Do not miss and be on time.

G. Homework

Homework assignments are ALL the even problems at the end of each assigned chapter, including Understanding Key Concepts and Additional Problems. You are strongly recommended to do all the homework problems! This is necessary to become proficient in the material. Homework will be graded as 2 points per chapter.

H. Academic Conduct

Classroom Courtesy: The instructor of this course has a strong commitment to the development and maintenance of an instructional climate that supports respect for everyone in the classroom. Your enrollment in this course requires that you will treat your fellow classmates and course instructor with respect. The instructor reserves the right to adjust course grades for disrespectful behavior.

Cheating: The University’s regulations that relate to academic misconduct will be fully enforced. I insist on seeing your own work group’s work. Any student suspected of cheating by copying on exams, changing answers on exams after they are scored, obtaining exam questions prior to the exam time, use of any previous student’s course work, plagiarism, giving or obtaining undeserved points on group work, or by other means will be referred to the Academic Conduct Committee. Students found guilty of academic misconduct face suspension or permanent dismissal. Anyone found by the Academic Conduct Committee to be guilty of misconduct will also receive a 0.0 grade for the course from the instructor in addition to whatever sanction(s) the Committee decides.
### IV. Tentative Timetable

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 4-9</td>
<td>1</td>
<td>Matter, Energy, and Life</td>
</tr>
<tr>
<td>September 11-16</td>
<td>2</td>
<td>Measurements in chemistry</td>
</tr>
<tr>
<td>September 18-23</td>
<td>3</td>
<td>Atoms and the periodic table</td>
</tr>
<tr>
<td><strong>September 25</strong></td>
<td><strong>Exam I</strong></td>
<td><strong>Chapters 1-3</strong></td>
</tr>
<tr>
<td>September 30-October 2</td>
<td>4</td>
<td>Ionic compounds</td>
</tr>
<tr>
<td>October 7-9</td>
<td>5</td>
<td>Molecular compounds</td>
</tr>
<tr>
<td>October 14-16</td>
<td>6</td>
<td>Chemical reactions: Mass relationships and classification</td>
</tr>
<tr>
<td><strong>October 21</strong></td>
<td><strong>Exam II</strong></td>
<td><strong>Chapters 4-6</strong></td>
</tr>
<tr>
<td>October 23-28</td>
<td>7</td>
<td>Chemical reactions: Energy, rates, and equilibrium</td>
</tr>
<tr>
<td>October 30- November 4, 6</td>
<td>8</td>
<td>Gases, Liquids, and Solids</td>
</tr>
<tr>
<td><strong>November 11</strong></td>
<td><strong>Exam III</strong></td>
<td><strong>Chapters 7-8</strong></td>
</tr>
<tr>
<td>November 13-18</td>
<td>9</td>
<td>Solutions</td>
</tr>
<tr>
<td>November 20-25</td>
<td>10</td>
<td>Acids, Bases, and Salts</td>
</tr>
<tr>
<td>December 2-4</td>
<td>11</td>
<td>Nuclear chemistry</td>
</tr>
<tr>
<td><strong>December 11</strong></td>
<td><strong>Final Exam</strong></td>
<td><strong>Chapters 9-11</strong></td>
</tr>
</tbody>
</table>