SYLLABUS

Course: General Chemistry I: CHEM-1030-003 (call # 30344)
Lecture: 9:00-10:25AM Mon.-Wed.; Room 6060
Recitation: 1 hour per week: Mon.; 12:00-1:00 Room 3066
Laboratory: 3 hours per week: Mon.; 1:00-4:00 Room 3066

Course Requirements

Text: General Chemistry

Laboratory Manual: The lab experiments are on the CCRI chemistry website: under academic departments. Click on "Faculty and Staff", then to "R. Kreiser", then to labs. The individual experiments can be downloaded as needed at CCRI or at home. You will need Adobe Acrobat Reader to open and print the lab experiments.

Homework Disks: Chem. Skill Builder is to be used for homework credit. It is found online at www.chemskillbuilder.com

Laboratory: Department Approved Safety Glasses
Scientific Calculator

Instructor: Dr. Ralph Kreiser
Room 3290

Introduction: This course is the first semester of General Chemistry for science, pharmacy, or engineering students. The lectures cover such topics such as chemical bonding, chemical reactions, solids, liquids, and gases. This material covers chapters 1-12 of the text. Three exams (given during the lecture period) and a cumulative final are given. The lowest exam grade is dropped. Weekly quizzes (given by the lab instructor) covering current lecture material are given. The lowest quiz grade will be dropped. In the one hour recitation before the lab the quiz will be given, questions answered, and current experiment discussed.

The lab experiments coordinate with the lecture material. There is a prelab assignment (prestudy), which must be done and handed in before the lab. Points are deducted if late. Lab reports involve filling in the report sheets in the lab manual and are due no later than a week after the lab is done. The lowest prestudy and lab report grades are dropped.
ChemSkill Builder, an online homework set is required and is worth an exam grade. The assigned topics must be done by the due dates for full credit.

No makeups are given for missed exams, quizzes or lab experiments. They will count as a drop.

SAVE THIS SYLLABUS FOR REFERENCE DURING THE SEMESTER.
General Information

Office: Room 3290, Third floor
Phone and Voice Mail: (401) 825-2261
Office Hours: Monday and Tuesday: 8:30-9:30
10:30-11:00
Wednesday and Thursday 8:30-9:30
10:30-11:00

Chemistry Secretary: (401) 825-2257

EMAIL: rkreiser@ccri.edu

School Cancellations: (401) 825-2344

Chemistry Website: http://ccri.edu/chemistry

Laboratories cancelled due to snow etc will not be made up.

The due dates for laboratory prestudies and laboratory reports will be assigned by and handed in to the individual laboratory instructor.

Quizzes are given at the beginning of the recitation class by the individual laboratory instructor and are usually on the previous weeks lectures material.

Exams are given during the normal lecture period.

No make-ups are given for missed quizzes, prestudies, exams, or labs.
One quiz, prestudy, and lab are dropped. No quizzes are given the recitation period following an hour exam.

Grading Scheme

The final grade is based on the following point distribution:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Maximum Points*</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Assigned Homework from disks</td>
<td>100 Points</td>
</tr>
<tr>
<td>b. Best 9/10 Quizzes</td>
<td>90 Points</td>
</tr>
<tr>
<td>c. Best 2/3-Hour exams</td>
<td>200 Points</td>
</tr>
<tr>
<td>d. Best 12/13 Prestudies</td>
<td>120 Points</td>
</tr>
<tr>
<td>e. Best 12/13 Laboratory</td>
<td>240 Points</td>
</tr>
<tr>
<td>f. Comprehensive Final Exam</td>
<td>200 Points</td>
</tr>
<tr>
<td>Total Maximum Points</td>
<td>950 Points</td>
</tr>
</tbody>
</table>

Percentage of Maximum Total Points

90% -- 100% = A
80% -- 89% = B
70% -- 79% = C
60% -- 69% = D
BELOW 60% = F

Fall 2008
I. Matter and Measurement

   Physical and chemical changes and properties
   Measurement, metric system, SI units
   Significant figures and dimensional analysis
   Experimental basis of chemistry

   Specific Heat (Chapter. 6: 6.5: pp 230-237)

II. Atoms and Elements

   Atomic theory and atomic structure
   Electrons, protons, neutrons, and isotopes
   Atomic Mass
   The Periodic Table of Elements
   Variation of chemical and physical properties
   Chemical formulas and nomenclature
   Writing and balancing chemical equations

III. Stoichiometry

   The mole and Avogadro’s number
   Mole to mass conversions
   Percent composition of substances
   Empirical and molecular formulas
   Mass relationships in chemical reactions
   Limiting reagent problems
   Percent yield

   Exam No.1  Wednesday, Oct. 8, 2008

IV. Chemical Reactions

   Molecular, ionic, and net-ionic reactions
   Precipitation reactions: Solubility rules
   Acid base reactions: Neutralization
   Molarity and dilution
   Gravimetric and volumetric analysis
   Titration and standardization

Fall 2008
V. Gases

Properties of gases 5.1
Boyle’s Charle’s Avogadro’s, Ideal Gas Laws thru
Dalton’s law of partial pressures 5.8
Density and gram molecular weights of gases
Molecular speeds and rates of effusion

VI. Thermochemistry

Kinetic and Potential energy 6.1
Units of energy thru
Enthalpy changes in chemical reactions 6.7
Hess’s Law
Enthalpy of formation

VII. Atomic Structure

Electromagnetic radiation 7.1
Bohr theory of the hydrogen atom thru
Electron transition calculations in hydrogen atom 7.9
Wave mechanical model of the atom
Quantum numbers
Shape of atomic orbitals
Spectroscopic notation and orbital diagrams
Electron configuration and quantum numbers

VIII. Periodic Table

Ionization energy and electron affinity 8.1
Relative sizes of atoms and ions thru
8.6

Exam No.2 Wednesday, November 19, 2008

IX. Chemical Bonding

Lewis dot structures 9.1
Bonding and nonbonding electrons thru
Single, double, and triple bonds 9.10
Octet rule
Resonance
Exceptions to octet rule

Fall 2008 4
| Text Topics                                      |  
|------------------------------------------------|---
| VSEPR theory                                    | 10.1  
| Prediction of molecular geometry thru           |  
| Lone electron pairs and molecular shapes        | 10.8  
| Polar bonds, dipole moments, and electronegativity |  
| Hybrid orbitals                                 |  
| Sigma and pi bonds                              |  
| Intermolecular forces in liquids                 | 11.1  
| Heating and cooling curves thru                 |  
| Fusion and vaporization                         | 11.9  
| Vapor pressure of liquids and solids            |  
| Phase diagrams                                  |  
| Structure and properties of solids              |  
| Solution concentration                          | 12.1  
| Molarity, molality, mole fraction, % by mass    | thru  
| Solubility of solids and gases                  | 12.8  
| Colligative properties of solutions             |  
| Vapor pressure lowering                          |  
| Boiling point elevation                          |  
| Freezing point depression                        |  

**Exam No.3 Monday, December 15, 2008**

Comprehensive Final Exam: Week of Dec. 16-22  
(Exact date and room location will be announced)

The final exam covers all twelve chapters and generally consists of double the multiple choice and essay question as a regular hour exam. Copies of old exams I, II, and III with answers are on reserve in the Learning Center. They may be xeroxed but not taken out of the library. No copies of the final exam are available.