Chemistry 105b
Advanced General Chemistry
Spring 2008

Lectures: Monday, Wednesday and Friday 9:30 – 10:30 Hilles 109
Laboratory: Monday and Tuesday 1 – 4 KINSC E305
One hour-long recitation (time to be determined)

Course Instructors:
Lecture: Alex Norquist KINSC E304C, 896-2949, anorquis@haverford.edu
- Office hours: Tuesday 2 – 3:30, Thursday 2 – 3:30
Laboratory: Casey Londergan KINSC E304B, 896-1217, clonderg@haverford.edu

Course Materials:
- Atkins and Jones "Chemical Principles, The Quest for Insight" 4th Edition
- Lab manual
- A bound laboratory notebook
- A simple scientific calculator. If you use a programmable graphing calculator, you may not use it in anyway that would give you an advantage over a student with a non-graphing scientific calculator, such as storing equations or solving equations.

Supplementary Materials: Many other general chemistry texts, which cover the same material, are available. Some are on Reserve in the White Science Library. Consultation of another text may be useful at times.

Class Attendance. Regular class attendance is crucial for success. Topics in Chem 105 may be discussed in more detail or from a different perspective than what is in the text. Test material will reflect the subject matter discussed in class.

Blackboard. Everyone enrolled in the course has access to the Chem 105 Blackboard site. The problem sets will be posted here, no hard copies will be distributed in class. Lecture handouts will be posted on Blackboard before each lecture. Remember to bring a copy to class.

Problem Sets. A list of assigned problems for the text will be posted on Blackboard each Monday. Selected problems from each list will be collected the following Monday. Due dates will always be specified on Blackboard. Students are encouraged to work together on the homework. However, each student **must** hand in his or her own copy of the problems that are to be graded.

The best way to learn chemistry is by working many many problems. The goal is to be able to complete the exercises without the aid of a solutions manual or class notes. This can only be accomplished by doing the problems.

Tests. There will be four tests during the semester, plus a comprehensive final exam. Material discussed during the two lectures before the first test will included on the second test. This holds true for each of the four hour tests. The dates for these tests are February 15, March 7, April 4 and April 25, during the scheduled class time. *Please note that March 7 is the last day before spring break.* **Mark these dates on your calendar!**

Late Work. The penalty for lab work will be 10% of the possible score per day. Two problem sets can be turned in one day late during the semester. These two 'days' can be used at any time, but no more than two are available.

Grading. There will be four hourly tests, graded homework, laboratory reports and a three-hour self scheduled exam. The homework average will have the same weight as one hourly test. All tests will be closed book and closed note.

Four tests	40 %		30 %
Final exam	25 %	or	35 %
Homework	10 %		10 %
Laboratory	25 %		25 %

The grades for the tests and final exam will be calculated both ways, with the highest average used in the final grade. This system provides a mechanism through which a poor semester performance can be salvaged by an excellent final exam. However, in our experience this seldom happens.

Help. If you are having difficulty with the reading, lectures, laboratory or problem sets there are several options for help.

- Work with other students in Chem 105b when doing the problem sets.
- The chemistry majors host a **Chemistry Question Center** 7:30 – 9:00 pm Sunday, Tuesday and Thursday in KINSC E310. This is a great opportunity to go over problems as well prepare for tests.
- See and instructor during office hours or make an appointment to see and instructor at some other time.

Laboratory. Specific information will be distributed separately. Once assigned to a laboratory section you are not allowed to switch sections.

Honor Code. All examinations in this course are given under the Haverford College Honor System. After each exam each student is asked to sign a pledge accepting full responsibility for conduct under the Haverford Honor System.

The application of the Honor Code is especially important to the laboratory part of this course. See the laboratory materials for details: the most important point is that you will not be allowed to discuss your laboratory work with anyone outside of your laboratory section other than the instructor and your teaching assistants.

We advise students to study and work together. Study sessions in which groups of students help one another to understand the material are extremely valuable. However, laboratory calculations and reports must be the work of the student submitting the report. The submission of another person's spread sheet or plot as your own work is a clear case of plagiarism.

Students who think they may need accommodations in this course because of the impact of a disability are encouraged to meet with me privately early in the semester. Students should also contact Rick Webb, Coordinator, Office of Disabilities Services

(rwebb@haverford.edu, 610-896-1290) to verify their eligibility for reasonable accommodations as soon as possible. Early contact will help to avoid unnecessary inconvenience and delays.

Chem 105b Syllabus
Spring 2008

The chapter listings correspond to Atkins and Jones "Chemical Principles, The Quest for Insight." More detailed reading assignments will be posted on Blackboard.

Atomic Structure **Chapter 1**

Interactions between light and matter, atomic spectra, orbital descriptions, electronic structure and periodicity will be discussed.

Chemical Bonds **Chapter 2**

Ionic and covalent bonding will be discussed.

Molecular Shape and Structure **Chapter 3**

The shape and structures of simple molecules will be discussed in the context of the VSEPR model, valence bond theory and molecular orbital theory.

Transition Metals **Chapter 16**

Trends in chemical and physical properties, coordination compounds, stereochemistry and Crystal Field and Ligand Field Theories will be discussed

The Properties of Gases **Chapter 4**

A discussion of both ideal and real gases, mixtures of gases and motion will be included.

Liquids and Solids **Chapter 5**

Intermolecular forces and a classification of solids, including crystalline materials will be included.

Thermodynamics **Chapter 6 and 7**

The first, second and third laws of thermodynamics will be used to understand the way we use food as fuel.

Physical Equilibria **Chapter 8**

Phases and phase transitions, solubility, colligative properties and binary liquid mixtures will be discussed.

Chemical Equilibria **Chapters 9, 10 and 11**

Topics include acid – base, solubility and ion formation.

Chemical Kinetics **Chapter 13**

Rate laws for reactions will be discussed.

Electrochemistry **Chapter 12**

Redox reactions, galvanic cells and electrolysis will be used as examples.