Chemistry 120 Syllabus
Spring 2005

Instructor	Ms. Brenda Harmon	**Office Hours**
	220A Pierce Hall	Wed 1:30-2:30
	4-8341	*All others by drop-in or appointment.

Resources

- Text: "Introduction to General, Organic, and Biochemistry", 6th edition, Bettleheim, Brown, & March
- Optional: study guide and solutions manual.
- Handouts, worksheets, study sheets and e-reserves.
- Review sessions.
- **The *instructor*. Feel encouraged to meet with to me if you are having any problems with this course. I promise to make every effort to help you learn chemistry, but it is *your* learning. The ultimate responsibility for your achievement is your own.

General Educational Goals

- Develop and improve study skills and work habits.
- Develop and improve your ability to self-monitor comprehension of complex material.
- Develop and improve your ability to understand and apply concepts – avoid rote memorization.
- Develop and improve your ability to evaluate health, consumer product, and advertising claims.

Course Objectives

- Understand and apply the fundamental concepts of organic chemistry (structure, properties, and reactivity) in the context of important biochemical processes and health related topics.
- Understand and describe simple chemical phenomena on both a microscopic and macroscopic scale.
- Understand the connection between the structure of organic compounds and their properties and reactivity. Be able to correctly draw and name organic structures and functional groups. Understand and describe intra- and inter-molecular forces, especially hydrogen bonding. Apply these concepts to understanding biological phenomena.
- Build organizational, analytical, problem-solving, and critical-thinking skills using chemistry specific approaches.
- Develop writing and record keeping skills. To strengthen your skills in communicating ideas and analytical results in a clear and concise manner.
- Develop the ability to observe closely and use scientific insight.
- Develop oral and written communication skills working with a team of peers.
- Utilize and reinforce previously learned chemistry concepts and skills.

Course Content

- Acid/Base and buffer chemistry in the context of body fluids.
- Structure, properties, naming, and a brief overview of reactivity :
  - Hydrocarbons (alkanes, alkenes, alkynes, and aromatics)
  - Alcohols, phenols, ethers, & halides
  - Aldehydes and ketones
  - Carboxylic acids and esters
  - Amines and amides
- The nature and effects of: isomerism, chirality, and hydrogen-bonding.
- Soaps, detergents, and surfactants: the chemistry behind getting clean.
- Oil and plastics: Chemistry in our daily lives.
- The molecules of life: carbohydrates, lipids, amino acids, peptides, and proteins.
- Polymers: natural and synthetic.
- Case studies: *Drug action, Is that pill your taking safe?, Stereochemistry, Carbohydrates, Are baby bottles safe?, Can of bull?, Olestra, and Nutrasweet.*
- Distillation of crude oil.
- Extraction of caffeine from tea.
- Synthesis of aspirin.
- Synthesis of soap.
- Forensic analysis of over-the-counter pain pills.

Grading Methods and Course Requirements

15 %	Worksheets and homework assignments
5 %	Participation in laboratory activities, case studies discussions, and group work
20 %	Writing assignments (case studies and laboratory assignments)
45 %	4 Exams (you will be able to drop the lowest exam grade)
15 %	Cumulative final exam

*Late assignments: 5 points per day excluding weekends and holidays.
*Assignments more than 3 days late will not be accepted.

Grades are based on percentages and usually assigned as follows:

93 - 100% A	78 - 80% C+
90 - 92% A-	74 - 77% C
88 - 90% B+	70 - 73% C-
84 - 87% B	68 - 70% D+
80 - 83% B-	60 - 67% D
	Below 60% F

Worksheets & Homework Assignments

Worksheets

Worksheet questions will cover material in the assigned reading from the chapters - prior to the lecture classes. You will be expected to read the assigned sections in each chapter and answer

questions based on the reading PRIOR to coming to lecture. This way I can lecture about 20-30 minutes and we can use the rest of the class time to work individually and in groups on the problems or class activities that will really help you learn the material. If I can see you working problems I can give you feedback on your progress and better gauge what help you need. I expect you to complete the worksheets on your own based on your comprehension of the reading material. A key for each worksheet will be posted outside my office. You will be able to drop the 2 lowest worksheet grades.

Homework

I will assign specific questions at the end of each chapter. You will be required to work these problems and turn in your solutions a few days after we finish each chapter in class. These homework problems can be discussed in your study group but the answers you record should be your own (no copying - if you don't actually work the problems yourself, you will not be able to work them in-class or on the exams). Don't wait until we finish a chapter to start working the problems, by then it will be too late to get help in class. Much of our class time will be devoted to working homework and similar problems. You will be able to drop the 2 lowest homework grades.

Quizzes

There will be a 5-10 minute "un-graded" quiz at the beginning of most class sessions. These quizzes will cover material that should have been learned by reading the chapters and completing the homework and/or worksheet assignments in order to prepare for class. I will use these quizzes as an assessment tool – they will give me an idea of what I need to cover in lecture and will give you an idea of how effective your reading and homework strategies are. I will assign a score to each of the quizzes – however I will not use these quiz scores in calculating your class grade. They are an un-graded assessment. I will, however, use your score on each quiz in assigning your homework/worksheet grade. If you have completed your homework but you fail the quiz…this tells us both that something is terribly wrong with your study strategy.

Group Work

You will be asked to form small groups for working in and out of class and lab. The groups will have two primary activities.

I. You will be asked to meet with your group *during* class to work on assigned problems. You should be completely prepared for class so that you can fully contribute.
II. You will work with your assigned group to complete case studies and lab activities.

Group member evaluations
At the end of the semester you will have the opportunity to evaluate your group members. This evaluation will cover topics ranging from knowledge and preparation to carrying a fair share of the workload. Remember, your other group members will have the opportunity to evaluate you. This evaluation will be considered when calculating your participation grade.

Participation

5% of your grade will be based on your active and engaged participation in laboratory activities, case study discussions, and group work.

Writing Assignments

Each case study and several of the laboratory activities will involve a writing assignment. You will be given the opportunity to revise your writing. Specifics for each writing assignment and grading criteria will be given to you at the appropriate times.

Laboratory Activities

Laboratory work will sometimes be completed during class time and also during the designated lab time (Thursdays from 1-4) depending on the topic. When class time is used for laboratory activities, the designated lab time will be used to make-up class work. Your laboratory assignments may include: written summaries of laboratory work, report sheets, and other assignments that supplement the laboratory work. <u>You are required to attend both lecture and laboratory sessions of the course.</u> *You must attend and pass both the lecture and laboratory portions of the course to pass the course.*

Exams

There will be four in-class exams -
Each exam will be worth 15 % of your course grade. You will be allowed to drop the lowest exam grade. Each exam will include multiple choice and short-answer questions as well as problems representing the homework and problems worked during class. An out-of-class essay will be assigned prior to each exam and will be turned in with the exam. The final exam will be comprehensive and will also count as 15% of your overall course grade.

Exams will be given on the days indicated in the schedule. In general, MAKE UP EXAMS WILL NOT BE GIVEN. In the case of an extreme illness or emergency, the instructor must be notified prior to the time of the scheduled exam. The instructor reserves the right to make any decisions regarding the possibility of a make-up exam. An unexcused exam absence will result in a grade of zero.

Absence Policy

Attendance will be taken at every class session, students will be allowed up to 3 absences without penalty. **After 3 absences, 1% point will be deducted from your final grade average for every missed class.** (Be aware: this means that if your final average is an 82 and you miss 7 classes, your final grade will now be reported as a 78. If you miss two or more of the laboratory activities you will fail the laboratory portion of the course. Attend the lectures and labs, do the assignments and do them to the best of your ability, and (as with everything in life) you will get out of it what you put into it.

Honor Code Policy

The Oxford College Honor Code applies to all work completed in this course. You are expected to do the assigned reading and answer the worksheet questions on your own. You may discuss the material with other students, but the answers you give should be your own. You are encouraged to work on the homework assignments in study groups. However, do not simply copy down answers from your group members. It will be obvious on the quizzes and during class activities if you do not understand the material. The writing assignments should be your work alone. You will be given the opportunity to revise your writing to use this as a learning opportunity. Do your own work.

Be aware that if you are found guilty of violating the Honor Code the usual penalty is an F in the course. A few answers on a worksheet or homework assignment, writing assignment, or for that matter on an exam, are not worth the pain and stress involved in an Honor Code case and hearing, and may result in a grade of F for the entire course.

Scheduled exam dates and tentative topics

Exam I **Thurs, Feb 2**
Review (atoms, ions, molecules, acids/bases, buffers, equilibrium)
Chemistry of Body Fluids
Intro to organic chemistry

Exam II **Tues, Feb 28**
Alkanes, fossil fuels
alkenes, alkynes, plastics and polymers
Alcohols, ethers, thiols

Exam III **Thurs, Mar 30**
Chirality, amines
Aldehydes, ketones,
Carboxylic acids, esters, amides
Soap

Exam IV **Thurs, Apr 27**
Carbohydrates
Lipids
Proteins, amino acids
Nutrition, digestion

Final Exam (comprehensive)

Friday, May 5 2:00 –5:00