SYLLABUS
ORGANIC CHEMISTRY 122

Summer Session 1, 2006
Temple University

Keep this syllabus. It contains much information essential to your success in this course.

INSTRUCTOR: **Dr. Kevin Cannon (kcc10@temple.edu, 215-204-3456)**
CLASSES: **T,W,R,F, 8:40 – 10:30, BE 166**
OFFICE HOURS: **By appointment**

COURSE DESCRIPTION: This course is the second semester of a two-semester sequence. It has Chemistry 121 as a prerequisite. This course continues the presentation of structure, synthesis, and reactivity of organic molecules. There will be an emphasis on reaction mechanisms, and applications of spectroscopy in the analysis of organic molecules will be introduced. Topics of relevance to biochemistry will also be included. The class will be taught using short lectures to introduce and explain the material in each chapter, but the student is responsible for reading the book and doing the assigned problems.

SCHEDULING: Attendance at all lectures and recitations is required for success. You are responsible for any announcements and schedule changes made during lecture. This summer course is fast-paced and covers a large volume of material in a very short time. Plan to devote adequate time to study solve problems. In case of an emergency you should make arrangements with the instructor for material that you have missed.

TEXTBOOK: John McMurry, **"Organic Chemistry, 6th Edition"** Brooks-Cole Publishing Co., 2004 is required. You should read each chapter **before** it is discussed. "Study Guide & Solutions Manual for Org. Chem." by Susan McMurry is recommended and may be purchased in the T.U. Bookstore.

GRADING:		
	Five quizzes	200 points
	Midterm exam	300 points
	Final exam	500 points
	Maximum Score	1000 points

MAKE-UPS: There will be no make-ups of missed quizzes or examinations. Assignments handed in past th due date, if accepted, will receive a grade deduction.

EXAMINATION POLICY: Unless otherwise indicated by the instructor, all quizzes and examinations are "closed book," meaning no books, notes, or reference material may be consulted during the Test period.

SOME FRIENDLY ADVICE: You probably already realize this from the first semester, but it is worth repeating: Organic Chemistry is a **difficult** course. For many, it will be the most difficult and time-consuming course of their college career. Unlike many courses, the concepts introduced each week of class will remain important during the remainder of the course. You can make it easier on yourself by doing the following: (1) Learn the **definitions** and reaction **summaries** at the end of the chapters. (2) Do study regularly. If you fall behind, it is very difficult to catch up. (3) Do as many problems as you have time for beyond those assigned (see below). The practice helps. There is too much material to remember everything. You should understand theory and method. Practice electron pushing. (4) Don't underestimate the importance of quizzes and homework assignments.

READINGS: Even though you may not understand the material fully the first time, you should read through each chapter BEFORE it is scheduled to be discussed in the lecture (see attached calendar). You will be held responsible for all the text material in those chapters, except for any sections that your instructor specifically tells you that you may exclude. Unforeseen circumstances may require that adjustments be made to the schedule.

PROBLEMS: Answers to all assigned problems can be found in the Study Guide. It is essential that you work through each problem and understand the theory/method used for its solution. Mere copying of the answer into your notebook is useless. Experience has shown that students who do more than the assigned problems, do well in this course. The listed problems represent the minimum necessary for you to develop a working foundation in chemistry. You are encouraged to work additional problems and seek help outside the classroom.

QUESTIONS: Questions and answers provide a useful vehicle to understanding. I expect and welcome questions during the lecture. Please ask questions at any time – don't be shy!!! Chances are your classmates may have the same questions as well.

TENTATIVE SCHEDULE: Chemistry 122 (May – June, 2006)

Lecture Week of:	Topic (McMurry) Chapters	Problems Assigned for Discussion
May 15:	14	Ch.14 1-9,20,25,27,28,33,38,40
	15	Ch.15 1-3,5-8,11,12,20,23a,c,25,29,33,37
	16	Ch.16 1,3,4,6-9,10a,11,13-19,22,31,49,57,67,70
	Quiz 1	
May 22:	17	Ch. 17 2-4,6,7,10,12a,14,15,27,30,35,40,44,49,50,54,623
	18	Ch. 18 1b,c,2,3b,d,5,6a,9,12,15,18,30,44,52,57,58
	Quiz 2	
May 29:	19	Ch. 19 2-4, 6,8-11,14,16,18,20a,c,32,36,38,39,41,55,58,69-71
	20	Ch. 20 2,3,5,8,9,11-13,25,26,33,35,43,49,58,59
	Midterm	
June 5:	21	Ch. 21 2,3,5,6,9,10c,11,12,14a,15-18,20,21,23,37,44,55,68
	22	Ch. 22 1,4,5,7,8,11,14,15,17,34,44,54,55
	23	Ch.23 1b,2,3c,4,5,8,10,11,13-17,20b,22,29,32,40,42a,e,43,45,50,5
	Quiz 3	
June 12:	24	Ch.24 2,4,6,7,10,13,14,18,30,39,59,66,69,70
	25	Ch.25 1-3,5a,6a,8b,12,14,15,17,20,22,27a,c,39,42,44,46
	Quiz 4	
June 19	26	Ch.26 1,2,7,8,12,29,50
	Quiz 5	
June 26	review (June 27 – Thursday schedule)	

Other important dates:
Monday, May 26 – Last drop date
Tuesday, June 13 – Last withdraw date

Miscellaneous: All cell phones are to be in a state of limbo (**turned off**) during class time.

GENERAL INFORMATION

Specific Goals and Objectives:

The primary objective of this course is to introduce the student to the fundamental principles of organic chemistry and to use those principles to develop analytical skills.
More specific objectives are:

- To be able to deduce the structural formulas of simple unknown compounds from molecular formulas and spectroscopic data including MS, IR, NMR and UV.
- To build on our understanding of chemical bonding and stereochemistry.
- To understand molecular orbital theory and the principles of aromaticity and to recognize the unique chemical behavior and stability of "aromatic" compounds as applied to benzene and related structures.
- To be familiar with the nomenclature, preparation and reactions of the functional groups: conjugated dienes, alcohols, phenols, ethers, epoxides, thiols, sulfides, and amines.
- To be familiar with and understand the nature and chemical behavior of the carbonyl group in the following classes of compounds: aldehydes, ketones, carboxylic acids and related structures.
- To understand the role of organic chemistry as it applies to biomolecules such as amino acids, peptides, proteins, carbohydrates and lipids.
- To build on the foundation of reaction mechanisms and learn additional organic reactions including the Diels-Alder reaction, electrophilic aromatic substitution, nucleophilic carbonyl addition reactions, nucleophilic acyl substitution reactions and carbonyl condensation reactions.
- To continue to use reactions to do multiple step transformations and carry out the synthesis of simple organic molecules.

Student Learning Outcomes:

Students will be able to:

- Recognize conjugated and aromatic compounds, alcohols, phenols, ethers, thiols, amines, aldehydes, ketones, carboxylic acids, amides, esters, sulfides and compounds related to these basic structures e.g. amino acids, carbohydrates, lipids, DNA, RNA, etc.
- Name in a systematic manner (IUPAC) simple organic compounds exemplified by the above classes and to draw their structures in three dimensions.
- Use data derived from instrumental methods (MS, IR, NMR and UV) to determine the structures of organic molecules.
- Predict the manner in which bonds are made and broken to bring about product formation, and understand the structural variations which affect the rate of reaction (reaction mechanisms).
- Know and appreciate the concept of aromaticity and how "aromatic compounds" differ from non-aromatic compounds.
- Understand additional organic reaction mechanisms such as aromatic substitution, nucleophilic addition, nucleophilic acyl substitution, carbonyl alpha-substitution and carbonyl condensations.
- Carry out in systematic fashion, using the above additional reactions encountered in this course, the synthesis of simple organic molecules.
- Use organic chemical reactions to carry out simple transformations of biomolecules.