Chemistry 211, Organic Chemistry Lecture
Fall, 2003 - A Hour, Room 205 Kennedy Hall
Dr. Richard Redfearn
Office – 409 Kennedy Hall
843-3960 (o), x3097 (lab), 832-9722 (cell); redfearn@rhodes.edu

Description: This course will consist of a general survey of elementary theory, preparation, reactions, and properties of the compounds of carbon, those containing the most important functional groups. We will accomplish this survey by exploring the underlying principles of reactivity of organic compounds.

Goals: To be successful in this course, the goals that you should work towards are:

1. Applying what you learned in General Chemistry to be able to understand the basics of physical and chemical properties of organic compounds.

2. Gaining the ability to: identify organic functional groups by name and structure; identify the types of reactions each organic functional group undergoes, organized by mechanism; analyze for different functional groups using infrared spectroscopy.

3. Learning to understand and describe the practical uses of organic compounds - in medical research, industry, and everyday life.

4. Achieving the ultimate goal of understanding the relationships between chemical structure vs. physical/chemical properties of organic compounds and materials, especially biological activity.

Note: Your goals in this course should not only be to memorize a series of organic transformations, but to understand and demonstrate how these many different reactions all flow from a basic set of fundamental principles. You will then be able to apply your knowledge of known systems to new ones.

Text: Brown, W. H.; Foote, C. S. Organic Chemistry, 3rd ed. You will receive a packet with the following materials: the textbook, and two CD-ROMs (ChemOffice Ltd. v. 4.5 and ChemOffice Web v. 6.0). The ChemOffice Ltd. CD-ROM has the stand alone versions of ChemDraw and Chem3D, which you will use to draw and understand chemical structures in three dimensions. You must retain BOTH CD-ROM disks in order to sell back your materials to the bookstore. Optional purchase: the Student Study Guide and Solutions Manual for the textbook.

The bookstore also has a supply of relatively inexpensive plastic “tinker toy” molecular models, which are highly recommended.

Evaluation: Your final grade will be earned with three hour-long exams (100 points each), plus the average of 10 weekly quizzes (100 points), and the final exam (200 points). You will take four hour-long exams, then I will drop the lowest hour-long exam grade and only use points from the best three exam grades. You will take 14 quizzes, and I will drop the four lowest quiz grades, averaging the 10 highest grades for the 100 points. The advantage of taking frequent quizzes is for you to get an evaluation of your progress that week. This will keep you on track and give me valuable feedback also. From time to time, we will meet in the Refectory, so that we can spread out and work on problems in an intensive, interactive manner.

The grading scale is:

A	558-600 points
A-	540-557
B+	522-539
B	498-521
B-	480-497
C+	462-479
C	438-461
C-	420-437
D+	378-419
D	336-377
D-	300-335

Policies: Your attendance at every lecture is expected and is important to effective progress in this course. You will get the most out of the lectures by being prepared – by reading the assigned material before the lecture. Each reading assignment should be read twice, once quickly and then in detail. Problem assignments should be done promptly, since these assignments are designed to help clarify the lecture material. I will usually open each lecture with the question "Do you have any questions from the assigned problems?" However, assigned problems will not be graded – BUT the assigned problems will make up the bulk of the weekly quiz questions.

If you find it necessary to miss a class, check my folder on the academic volume for any special reading assignment for the next lecture, and any new assigned problems for the lecture that you missed. You will be allowed to make up a missed quiz/exam only with an excused absence. If possible, you should let me know ahead of time if you are unable to take a quiz or exam at its scheduled time. If your absence for a quiz or exam is not excused, you will receive no points for that evaluation.

I strongly encourage the use of molecular models, and you may use them during exams. You will also be trained in the use of chemical drawing programs - ChemDraw and Chem3D, for either PC or Macintosh. Chem3D will allow you to visualize and rotate a molecule, so that you can appreciate its three-dimensional shape. If you do not have a personal computer, these programs are available on computers in the Computer Center (Buckman Hall).

Of course, the Honor Code governs your behavior in this class, and all work turned in for grading must be pledged to be your own. The lecture schedule is only a rough guide, and most likely will not be strictly adhered to. The quiz/exam schedule will be followed exactly. Quiz questions will be selected from assigned problems and/or similar ones. Also, at least one question on each weekly quiz will be taken from the assigned text reading for that week, not a problem.

My door is always open to you for questions regarding your progress in this class, and I am very interested in helping you to be successful in your study of organic chemistry. Please feel free to drop by 409 Kennedy, or see me in one of my labs on the fourth floor. My schedule will be posted by my office door. I will answer voice mail or email within 24 hours of receipt.

Tips on doing well in organic chemistry:

1. Show up to class. It will take much longer to learn the material on your own, rather than relying upon your instructor's help. If you fall behind in organic chemistry, it's extremely difficult to catch up.

2. Ask questions! (of course this only applies if you follow rule number one). There is no way that you are going to understand every aspect of this course without asking questions, so stick your hand up and ask away. Or even better, visit me at my office. I am more than glad to help with any aspect of learning organic chemistry. If we can't clear up the confusion in 15 minutes or so, we will schedule a longer tutorial appointment at a mutually agreed-upon time.

3. Read and understand the material in the text. First, scan the chapter to gain an appreciation of the highlights. Then, back up and read in detail, taking time to do the in-text problems. You can't read technical material like a novel – that makes for a good insomnia remedy. Then, start to work on the assigned problems. Count on 1½ to 2 hours of study for every lecture hour, more if you are having trouble with the material. You should have at least scanned the chapter BEFORE the first lecture on that chapter. You ought to have read and understood the chapter before the second lecture on that chapter – including time spent working on the problems.

4. Take good notes. Come to class prepared by reading and summarizing the chapter before we complete that chapter in class. Pay attention and take good notes while in class. After each class read over, rephrase, and rewrite your notes while the day's topic is still fresh on your mind. Click here for suggestions on learning how to take good lecture notes. (http://www.unr.edu/acssv/ASC/skills/notes/notes.html)

5. Problems: practice, practice, practice! There is no easy way around this. Don't just look to see what the solution manual says before you have done a problem. Use it only when you have wrestled and fought *mano a mano* with a problem for at least fifteen minutes, and it has come out the victor. This is a problem-solving course.

6. Find a study partner or organize a study group. Sometimes an explanation from a fellow student will seem clearer to you than my explanation. I have little interest in exactly how you learn, only that you do learn the material – we all have different learning styles. Drilling each other will really help with learning how to solve organic problems.

7. Learn how to be smart on exams. Click here for "Ten ways to pass your next chemistry exam." (Also check out the links here to more chemistry information, especially "Just Ask Antoine!") http://antoine.frostburg.edu/chem/senese/101/examtips.shtml

8. Use www links to chemistry education sites. Some are included here, and we will discover more together.

http://www.cem.msu.edu/~parrill/ (thanks to Prof. Abby Parrill, Univ. of Memphis)
http://www.colby.edu/chemistry/OChem/demoindex.html - table (Colby College)
http://www.rhodes.edu/public/2_0-Academics/2_5-Library/2_5-index.shtml (Rhodes College library)

"If the teacher is indeed wise he does not bid you enter the house of his wisdom, but rather leads you to the threshold of your own mind." (Khalil Gibran, The Prophet)

CLASS SCHEDULE:
Note: CIA = "Chemistry in Action" reading; C&EN = Chemical and Engineering News

WEEK	DATE	MATERIAL STUDIED
Week 1	August 27	Introduction; Chapter 1: Covalent Bonding and Shapes of Molecules
	August 29	Chapter 1 **QUIZ 1**
Week 2	September 3	Chapter 1
	September 5	Why "shape" is important: Buckyball CIA, p. 24; shapes of proteins, pp. 1098-1105 **QUIZ 2** ♥ Biological Example
Week 3	September 8	Chapter 2: Alkanes and Cycloalkanes; using infrared (IR) spectroscopy to detect and characterize alkanes, pp. 427-437
	September 10	Chapter 2
	September 12	"Alkane-like" biological molecules: saturated fatty acids in cell membrane lipid bilayers , pp. 1059-1063 **QUIZ 3** ♥
Week 4	September 15	**EXAM 1: Chapters 1 and 2**
	September 17	Chapter 3: Chirality
	September 19	Chapter 3 **QUIZ 4**
Week 5	September 22	Chapter 3
	September 24	Chapter 3
	September 26	Chirality for profit: Chiral Drugs CIA, p. 125; C&EN handout **QUIZ 5** ♥
Week 6	September 29	Chapter 4: Acids and Bases; IR spectra, p. 443
	October 1	Chapter 4
	October 3	Are DNA and RNA acids or bases? Read pp. 1118-1125 **QUIZ 6** ♥
Week 7	October 6	**EXAM 2: Chapters 3 and 4**
	October 8	Chapter 5: Alkenes I; IR spectra, p. 437
	October 10	Alkenes can give different shapes to triglycerides: polyunsaturated fats, pp. 1045- 1048 **QUIZ 7** ♥
Week 8	October 13	Chapter 5
	October 15	Chapter 6: Alkenes II
	October 17	Terpenes and Vincent van Gogh's turpentine pica, class discussion **QUIZ 8** ♥
Week 9	October 22	Chapter 6
	October 24	Chapter 6 **QUIZ 9**
Week 10	October 27	**EXAM 3: Chapters 5 and 6**
	October 29	Chapter 7: Haloalkanes, Alkenes, and Arenes; IR spectra, pp. 438-439
	October 31	Chapter 7 **QUIZ 10**
Week 11	November 3	Chapter 7
	November 5	Chapter 7
	November 7	How we become rancid, and its prevention by phenolic antioxidants like Vitamin E: Radical Autoxidation CIA, pp. 262-263 **QUIZ 11** ♥

WEEK	DATE	MATERIAL STUDIED
Week 12	November 10	Chapter 8: Nucleophilic Substitution and β-Elimination
	November 12	Chapter 8
	November 14	Chapter 8 **QUIZ 12**
Week 13	November 17	Chapter 9: Alcohols and Thiols; IR spectra, p. 439
	November 19	Chapter 9
	November 21	Mother Nature's "simple" fermentation process – only 12 steps: pp. 1161-1163 **QUIZ 13** ♥
Week 14	November 24	**EXAM 4: Chapters 7, 8, 9**
Week 15	December 1	Chapter 10: Alkynes; IR spectra, p. 438
	December 3	Chapter 10
	December 5	Chapter 10 **QUIZ 14**
Week 16	December 8	Chapter 11: Ethers, Sulfides, and Epoxides; IR spectra, p. 440
	December 10	Chapter 11
	December 12	**FINAL EXAM, Chapters 1-12 Friday, Dec. 12, 8:30-11:00 am**