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## CHEM 212-01 and 02, Organic Chemistry, Spring 2003

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## **Chemistry 212, Organic Chemistry Lecture**

Spring, 2003 - C Hour, Room 205 Kennedy Hall

Dr. Richard Redfearn

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**Description:** This course will continue the general survey of theory, preparation, reactions, and properties of the compounds of carbon containing the most important functional groups. Also included this semester will be spectroscopic methods used to analyze 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 and the first course in Organic Chemistry to be able to understand the basics of physical and chemical properties of organic compounds.
2. Continuing to refine the ability to identify organic functional groups; also to identify the types of reactions each organic functional group undergoes, organized by mechanism.
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. reactivity and vs. physical/chemical properties of organic compounds and materials.

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, the Student Study Guide and Solutions Manual for 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.

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). About weekly quizzes: you will take 14 quizzes, and I will drop your four lowest quiz grades, averaging the 10 highest grades for the 100 points. The advantage of taking these short little tests is for you to get an evaluation of your progress that week. This will keep you on track and give me valuable feedback about my teaching effectiveness.

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

**Also, please note:** As part of your evaluation, you will be required to attend at least two presentations at the **April 29, 2003** Undergraduate Research and Creative Activity Symposium. One of these must be related to natural science, and the other must be in one of the sessions offered from the Social Science, Fine Arts, or Humanities division. This is being required in an effort to broaden your understanding of the breadth of the creative activity being done by your fellow students, so I do not want you to only attend Natural Science presentations, rather to expand your experience with the consideration of other types of scholarship.

**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. However, assigned problems will not be graded.

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, EXCEPT for the Final Exam, which will be the ACS Organic Chemistry Standardized Exam. You will also have available the chemical drawing programs - ChemDraw and Chem3D. 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 or similar ones.

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.

**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. For that matter, visit me at my office. 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. 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.

**4. Take good notes.** Come to class prepared by reading and summarizing the chapter before we go over it 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. 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.

**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.chem.ucla.edu/~webspectra/> spectroscopy problems, with solutions  
<http://www.nd.edu/~smithgrp/structure/workbook.html> spectroscopy problems, without solutions  
<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://blair.library.rhodes.edu/chemtesthtmls/chemnet.html> (Rhodes College library)

**CLASS SCHEDULE:**

<b>WEEK</b>	<b>DATE</b>	<b>MATERIAL STUDIED</b>
Week 1	January 15	Welcome back & refresher on organic chemistry, or natural beauty
	January 17	Chapter 12 <b>QUIZ 1:</b> spectrometry/spectroscopy “workshop”
Week 2	January 22	Chapter 13: $^{13}\text{C}$ NMR & refresher on $^1\text{H}$ NMR
	January 24	Chapter 13 <b>QUIZ 2</b>
Week 3	January 27	Chapter 14: Mass Spectrometry
	January 29	Chapter 14
	January 31	Chapter 14 <b>QUIZ 3</b>
Week 4	February 3	<b>EXAM 1</b>
	February 5	Chapter 23: Conjugated Systems
	February 7	Chapter 23 <b>QUIZ 4</b>
Week 5	February 10	Chapter 15: Organometallic Compounds
	February 12	Chapter 15
	February 14	Chapter 15 <b>QUIZ 5</b>
Week 6	February 17	Chapter 16: Aldehydes and Ketones
	February 19	Chapter 16
	February 21	Chapter 17: Carboxylic Acids <b>QUIZ 6</b>
Week 7	February 24	Chapter 17
	February 26	Chapter 18: Derivatives of Carboxylic Acids
	February 28	Chapter 18 <b>QUIZ 7</b>
Week 8	March 3	<b>EXAM 2</b>
	March 5	Chapter 19: Enolate Anions and Enamines
	March 7	Chapter 19 <b>QUIZ 8</b>
Week 9	March 17	Chapter 19
	March 19	Chapter 20: Aromatics I: Benzene and Derivatives
	March 21	Chapter 20 <b>QUIZ 9</b>
Week 10	March 24	Chapter 21: Aromatics II: Reactions of Benzene and Derivatives
	March 26	Chapter 21
	March 28	Chapter 21 <b>QUIZ 10</b>
Week 11	March 31	Chapter 22: Amines
	April 2	Chapter 22
	April 4	Chapter 22 <b>QUIZ 11</b>
Week 12	April 7	<b>EXAM 3</b>
	April 9	Interchapter: Medicinal Chemistry
	April 11	Chapter 24: Organic Polymer Chemistry <b>QUIZ 12</b>
Week 13	April 14	Chapter 24
	April 16	Chapter 25: Carbohydrates

<b>WEEK</b>	<b>DATE</b>	<b>MATERIAL STUDIED</b>
Week 14	April 21	Chapter 26: Lipids
	April 23	Chapter 26
	April 25	Chapter 27: Amino Acids and Proteins <b>QUIZ 13</b>
Week 15	April 28	Chapter 27
	April 29	<b>Undergraduate Research &amp; Creative Activity Symposium</b>
	April 30	Chapter 28: Nucleic Acids
	May 2	Chapter 28 <b>QUIZ 14</b>
	May 5 (Mon)	<b>FINAL EXAM, 1:00-3:30 pm</b>