

Chemistry 128 Spring 2006, Organic Synthesis

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office hours: M, W, F: 10-11 am or by appointment

Text: *Advanced Organic Chemistry Part B: Reactions and Synthesis*, fourth edition, by Carey and Sundberg

Web site: Listed under chemistry department web pages: www.chem.csus.edu/ckyuen and on WebCT at online.csus.edu.

Course Description: Application of functional group reactions to multi-step syntheses. Recently developed synthetic methods and literature searching will be emphasized.

Course prerequisites: Successful completion of Chemistry 124 (with a grade of C).

Learning Objectives:

Students will be able to recognize various types of synthetic transformation reactions and utilize these reactions to perform multi-step syntheses of organic molecules. Students will become familiar with protecting groups and their use in these multi-step syntheses. Understanding and drawing of reaction mechanisms will be emphasized.

Grading:

Quizzes (20 pts each)	100
Problem sets	150
Exams (100 pts each)	300
<u>Final</u>	<u>200</u>
Total	750 pts

Letter grades are assigned based on a range of: A to A- = 88% and above, B+ to B- = 87-78%, C+ to C- = 77-66%, D = 65-55%, F = Below 55%

Quizzes:

Quizzes will be short 10-15 minute problems at the end of class. Keep the best 5 of 7 scores. No Make-ups. These quizzes will cover the current topic under discussion.

Problems:

Problem sets will be assigned throughout the semester and will be handed in for grading. In addition, please remember that there are problems at the end of each chapter in your book. Even if these are not assigned, TEXTBOOK PROBLEMS MAKE FOR GOOD TEST QUESTIONS! The material covered this semester cannot be understood well enough to get a passing grade by simply attending lecture. You must read the chapters in advance of the lectures and do practice problems outside of class or you will fall behind. It is HIGHLY recommended that you attempt all of the problems within the chapter in order to gauge your comprehension of the material.

Exams:

Three 100 point exams will be given through the course of the semester. The exams will mainly consist of three kinds of questions: 1) What are the organic products of a given reaction?; 2) Write out a reasonable mechanism for a given transformation; and 3) What reagents / conditions could be used to perform a given transformation? You may have ONE 3 x 5 inch note card for the exam on

which you may write whatever you deem helpful on one side of the card. The only stipulation is that the notes must be hand written, not printed or photocopied. No magnifying glasses are allowed. Since each exam builds on old material, each exam should be considered cumulative.

There are no make-up exams; one missed exam may be made up with the score from the final exam.

Final:

The final for this class is scheduled for Friday, May 19th from 8-10 am in the classroom. It will be a comprehensive, 200 point exam. You may have ONE 5 x 8 inch note card for the exam on which you may write whatever you deem helpful on one side of the card. The only stipulation is that the notes must be hand written, not printed or photocopied. No magnifying glasses are allowed.

Lectures:

We will begin the year with a review of concepts from Chem 24 and 124. We will cover **Chapters 1, 2, 3, 4, 5, 7, and 12** in the textbook. Please use the schedule below to keep track of where we are in the lecture. General dates for tests are indicated, but rely on class announcements for the exact timing.

Week of: of:	Monday	Wednesday	Friday
1/23	Review	Review	
1/30	<i>Quiz 1</i>		
2/6		<i>Quiz 2</i>	
2/13			Exam 1
2/20			
2/27	<i>Quiz 3</i>		
3/6			<i>Quiz 4</i>
3/13	NO CLASS	NO CLASS	NO CLASS
3/20			
3/27	Exam 2		
4/3		<i>Quiz 5</i>	
4/10			<i>Quiz 6</i>
4/17			
4/24	<i>Quiz 7</i>		
5/1		Exam 3	
5/8			
5/15			Cumulative Final 8-10 am

Suggestions for Study:

There are as many different methods to study as there are people who study. No one method works for everyone. Only one principle is unalterable: you **MUST** study. Devote some time to study each day and you will not be overwhelmed at test time. Since everything in organic chemistry builds up from the same foundation, not understanding the basics will mean not understanding anything based upon it. **GET YOUR QUESTIONS ANSWERED IMMEDIATELY** or you will very quickly get lost.

One method of study that is highly recommended by previous 128 instructors is the 3 x 5 flashcard method. Place a reaction on one side with all the pertinent notes about conditions but no clues as to products. On the reverse side write the product and any notes about the reaction (exceptions, necessary protecting groups, etc.) Make cards for reactions from the lecture, from the text, and from old Chem 24 and 124 exams (particularly those which have caused you problems on old exams). Since each exam builds on old material, each exam is cumulative.

Practice drawing mechanisms with curved arrows for these reactions, as this will provide the logic behind each transformation which will give you the power to predict the products of unknown reactions.

Mechanism Tips: When writing a mechanism remember the basic rule—whatever is most reactive dominates the process. Show all arrows for each step of the reaction path, and show all intermediates. Resonance structures are important because they can emphasize the fact that many compounds can react at more than one site. Finally, do not take shortcuts—Do not write “PT” in place of showing arrows for proton movement, and **DO NOT** indicate any “naked protons” (H^+) in any mechanisms! Mechanistic understanding is at the heart of all complex, multi-step reactions and will be fundamental for any future work in graduate school.

Cheating:

Cheating in any way, shape, or form is not tolerated in this class. A student caught cheating will receive a zero on that quiz/exam and it will count towards the student's final grade. If a student is caught a second time, the student will fail this course. Cheating includes copying from another student's paper, using extra materials during testing, programming data into a calculator, having other people take tests for you, altering exams after they have been graded, etc.

Special Needs:

Any student needing special accommodations should see the instructor immediately.