

LECTURE SYLLABUS

Course	Organic Chemistry I, Chem 31: Lecture and Laboratory
Time and Location	MTWThF - 1:00-4:00 pm Daly Science 207
Texts	Lecture: Lecture text for this course is optional. The following texts/resources may be useful for you in this course: <ol style="list-style-type: none">1. <i>Organic Chemistry</i>, Carey2. <i>Organic Chemistry</i>, McMurry3. Virtual Text in Organic Chemistry: http://www.cem.msu.edu/~reusch/VirtualText/intro1.htm4. Any reasonable organic chemistry text for lecture preparation-reading on topics to be covered in the subsequent lecture. Texts by Loudon, Wade, Solomons are also good.5. <i>Organic Chemistry as a Second Language</i>, Kline Lab: Required Materials <i>Experimental Organic Chemistry</i> (used in Chem 31, 32, and 33) (Gilbert and Martin, SCU custom edition, 2010, in bookstore) Supplemental Organic Chemistry Laboratory Packet (on website) Safety goggles, lab coat, and a bound SCU notebook for laboratory. You can purchase lab textbook, notebook, and lab coat from the SCU Bookstore and we will sell goggles in the Chemistry Department the first few days of class. You are required to use a notebook that we ordered especially for Chem 31-33, which can be purchased from the Campus Bookstore. The lab notebook is black with numbered, quad ruled pages. Do not purchase other notebooks that could be on sale in the bookstore.
Instructor	Lecture: Dr. John D. Spence Email: jdspence@scu.edu (summer); jspence@csus.edu (permanent) Web: http://www.csus.edu/indiv/s/spencej/ Laboratory: Drs. DiPietro and Ruhland
Office Hours	MTWTh 4:00-5:00 pm (other times by appointment) Location TBA

Objectives and Approach

This course will develop a number of basic concepts that will serve as the foundation for understanding organic chemistry. Learning these fundamentals will enable you to evaluate and comprehend all of the new material encountered during the organic chemistry sequence. The approach to achieve this objective is to reinforce these basic principles throughout the course demonstrating their application to problem solving.

An important goal of this introductory course is to teach the principles of organic reactivity through the careful study of each step in the reaction processes we encounter. A stepwise description of the reaction process is commonly referred to as the reaction mechanism. An understanding of mechanism is the foundation for further learning and problem-solving in organic chemistry and eases the burden of memorization in the course by demonstrating the relationships between reactions. The use of mechanism

in problem-solving develops cognitive skills as the basic knowledge and understanding of chemical reactions must be applied to answer challenging questions on exams and problem sets. Developing the ability to critically analyze a reaction using the rules of chemical reactivity is one of the primary learning objectives for this course.

Since many of these concepts are new, it is important to become familiar with the topics to be discussed before lecture. Scanning the chapter material before class will greatly increase your comprehension of the lecture material and should only take about 30 minutes a lecture. Learning studies have shown that if a student reviews their notes directly after lecture, their comprehension of the concepts greatly improves. Take the time to review your notes after lecture and bring your questions to class or office hours.

To accurately assess your progress in this course, you must do **as many problems as possible**. Chemistry is a problem solving discipline and therefore doing the problems is a prerequisite to success in this and any chemistry course. If certain problems cause difficulty even after consulting the answer keys, see me during office hours for further explanation.

Use of Answer Keys and Problem Solving:

Many students do the problems *with* the study guide/answer key instead of consulting it when they have questions, thereby truncating the learning process. The best approach is to challenge yourself to work the problem a number of times before consulting the answer for assistance. This will force you to review the lecture material and develop your skill and tenacity at working the problems. If you cannot come up with a reasonable answer, consult the key for the answer only! Then try to rework the problem to achieve the right answer. When seeking out help with the problems, from me or other students, be sure to ask for only enough information to get you started on the problem. This process will improve your ability to solve the problems independently and more accurately reflect your progress. Development of strong problem-solving skills is a goal of this course and essential to your future success in science.

Course Content

We will begin reviewing some topics covered in general chemistry such as Lewis structures, molecular geometry, and atomic orbital hybridization. This leads into the topics of covalent bonding and molecular orbitals. From this background we will study three classes of organic compounds and their reactions: alkanes, alkyl halides, and alkenes. Using our understanding of atomic and molecular structure, we will study the relationship between structure and reactivity. To demonstrate the principles of organic reactivity, we will develop our understanding of each step of the reaction mechanisms so that reaction outcomes make “chemical” sense. This fundamental understanding of reaction mechanism will allow you to predict reaction results and interpret the new reaction processes encountered in this course. Other important concepts include: bond formation and cleavage, the strength of acids and bases, resonance and stereochemistry.

Academic Integrity

Giving or receiving unauthorized aid in any form can result in course failure. See me if further clarification is needed. I also expect you to apprise me of any violations of academic integrity of which you may be aware. Cheating by an individual should be viewed as a significant problem in an academic community that values ethics such as Santa Clara University. Student who do their own work but are reluctant to report those who don't; remember that there is no honor in protecting unscrupulous peers and such individuals do not deserve your loyalty.

Standards

This course is a prerequisite for Chemistry 32, Organic Chemistry II. A grade of C- or higher in Chem 31 is strongly recommended before taking Chem 32. Students who receive grades lower than C- are urged to meet with their instructor before considering continuing on to Chemistry 32. If you do not meet the standards as stated, it is your responsibility to not enroll, or to withdraw from pre-enrollment, in

Chemistry 32. If you do enroll for a course for which you do not qualify, you are subject to Administrative Withdrawal on the first day of class.

Disability Accomodation Policy:

To request academic accommodations for a disability, students must contact Disabilities Resources located on the second floor of Benson. Phone numbers are (408) 554-4111; TTY (408)554-5445. Students must register and provide documentation of a disability to Disabilities Resources prior to receiving academic accommodations.

Grades

Grades will be based on your performance on two exams (100 points each) and the cumulative final exam (200 points). Your grade in laboratory will have a small but possibly significant impact on your overall final grade, possibly to increase or decrease your overall course grade. Unsuccessful completion of the laboratory work is grounds for failure in the course. Final grades will be based on a curve which reflects your performance relative to the average for the class.

CLASS SCHEDULE

<u>DAY</u>	<u>DATE</u>	<u>TOPIC</u>	
M	Jun 16	Hybridization, Bonding, Drawing Organic Compounds	
T	Jun 17	Bond Polarity, Resonance, Acid-Base Chemistry	(last day to drop 100% refund)
W	Jun 18	Functional Groups, IR Spectroscopy, ¹³ C NMR, Alkanes	(last day to drop 50% refund)
Th	Jun 19	Conformational Analysis, Stereochemistry	
F	Jun 20	EXAM 1 ; Describing Organic Reactions	(last day to withdraw no W)
M	Jun 23	Alkenes (structure, stability, nomenclature, reactivity)	
T	Jun 24	Alkenes (reactions and syntheses)	
W	Jun 25	Alkynes (nomenclature, structure, stability, reactions)	
Th	Jun 26	Alkenes and Alkynes Problem Solving	
F	Jun 27	EXAM 2 ; Begin Substitution Chemistry	(last day to withdraw with W)
M	Jun 30	Bimolecular Substitution (S _N 2) and Elimination (E2)	
T	Jul 1	Unimolecular Substitution (S _N 1) and Elimination (E1)	
W	Jul 2	Competing Substitutions and Eliminations; Alcohol Sub/Elim	
Th	Jul 3	Problem Solving, Course Review	
F	Jul 4	FINAL EXAM	

Course Website

On my website (<http://www.csus.edu/indiv/s/spencej/>), you will find a link for Chem 31 that will contain select lecture notes, sample quizzes, sample exams, and homework problem sets for each topic, along with answer keys for all homework sets. You should plan to work as many homework problems as possible to prepare for the course exams (try not to rely heavily on the answer key!). You can use the blank sample exams to test your understanding of the material prior to the class exams. Frequently, students believe they have a firm understanding of the material, but their performance on exams is not consistent with their perceived comprehension. I will not directly test your knowledge of concepts, but rather I will test the application of learned concepts through problem solving. By taking a practice exam, you will gain valuable feedback regarding your ability to solve challenging exam-level problems. Please note that the sample exams may cover slightly different material than exams for the summer session of chem 31. Answer keys for exams this summer will also be posted on the course website.