

LECTURE SYLLABUS

Course Organic Chemistry III, 33: Lecture and Laboratory

Lecture M-F -- 1300-1600, Daly Science 207

Texts Lecture: Your lecture notes and the following packet will serve as the only official text for the course:

Problems Packet. This packet contains copious problems that you will need to complete in order to test and reinforce your understanding of the material. It is available for download, and printed copies may be purchased at Copy Craft, 342 Lafayette St.

Although there is no required textbook for the course, you may also find these books/resources useful to supplement the material I present:

1. Virtual Text in Organic Chemistry:
<http://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/intro1.htm>
2. Any standard, beginning organic chemistry text. Examples include those by McMurry, Carey and Giuliano, Loudon, and Wade. All are titled *Organic Chemistry*.

Laboratory: : *Laboratory Techniques in Organic Chemistry* by Mohrig, Alberg, Hofmeister, Schatz, and Hammond, 4th Edition. Other materials for laboratory can be found on Chem 33 Laboratory webpage (<https://sites.google.com/a/scu.edu/organic-chemistry-laboratory/>) or from Camino. You also must bring your safety splash goggles, lab coat and lab notebook to laboratory every day, including the first day your lab section meets.

Supplements: Molecular model set, bound notebook for laboratory. (You are required to use a notebook that we ordered especially for Chem 31-33, which can be purchased from the Campus Bookstore. The laboratory notebook is black with numbered, quad ruled pages and embossed with "Santa Clara University" from the Scientific Notebook Company Do not purchase other notebooks that could be on sale in the bookstore. **You may use the same notebook as you purchased for Chem 32L.**)

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Office Hours M, T, W, R 1600-1700; Other times by appointment

Course Content and Objectives

In this third term of the three-course sequence, we will study alpha substitution and condensation reactions of carbonyl compounds. Our attention will then turn to conjugated pi bonded systems: we will study the special characteristics and reactions of conjugated dienes, benzene, and other aromatic compounds. Lastly, we will apply our knowledge of organic chemistry to biologically relevant compounds. Carbohydrates, amino acids, heterocyclic compounds, and lipids will be investigated in our studies of the organic chemistry of biomolecules. The objective is again to combine specific knowledge and guiding principles to solve problems.

Specific learning objectives are:

1. Communicating chemical information effectively. You will learn both the technical vocabulary used and the clear representation of chemical structures and reaction mechanisms.
2. Relating physical and structural properties of organic molecules with their reactivities. You will learn to identify and compare the molecular features that govern chemical reactivity.
3. Predicting the outcome of chemical reactions. You will learn to think critically applying central principles of organic chemistry to solve chemical problems in a rational manner.
4. Applying chemical principles in the laboratory. You will learn to execute independent experiments that supplement and complement the topics covered in lecture. You will become proficient in essential techniques for the reaction, isolation, purification, and identification of organic compounds, and the proper disposal of waste produced in generating them. You will also learn the proper use and maintenance of a laboratory notebook as a record of your experimental work.

Grades

Grades will be based primarily on your performance on 2 exams (100 points each) and the final exam (200 points). The final exam will include the ACS Standardized Exam, which covers material from the entire sequence. You should review throughout this term to prepare for this exam. Your grade in laboratory work will have a small but possibly significant impact on your overall final grade and may increase or decrease your grade. **Unsuccessful completion of the laboratory work is grounds for failure in the course.** Final grades will be based on a curve that reflects your performance relative to the average for the class.

Academic Integrity

Giving or receiving unauthorized aid in any form can result in course failure. See me if you need clarification on what constitutes unauthorized aid in your lecture or laboratory work. 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 personal insult to all students who do their own work; there is no honor in protecting unscrupulous peers, and such individuals do not deserve your loyalty.

You are expected to maintain the highest standards of academic integrity in both the lecture and laboratory components of this course. More information about the SCU policy on academic integrity can be found at: www.scu.edu/academic-integrity or p.15 of the Student Handbook.

In the lecture, you will be asked to sign an academic integrity pledge at each exam. The pledge reads: "I am committed to being a person of integrity. I pledge, as a member of the Santa Clara University community, to abide by and uphold the standards of academic integrity contained in the Student Conduct Code."

Exam Policies

Prior to exams or quizzes, it is **your** responsibility to ensure that any course materials, such as class notes or study sheets, are stowed completely out of view. All allowed materials for each exam or quiz (except for an optional model kit) will be provided by the instructor. Using your own scratch paper is not permitted. If the instructor sees any resources that are not allowed, you will be subject to academic integrity sanctions, which can include course failure. Phones must be turned off, put away, and not accessed during the test.

You are expected to remain in the classroom during the entirety of any exam/quiz; use the restroom prior to any test. If using the restroom during a test is unavoidable, all of your testing materials and electronic resources (e.g. phone, Apple watch) must remain in the classroom, and you must ask the

instructor's permission to take a brief restroom break. Taking materials/electronics with you to the restroom is a breach of academic integrity and will result in sanctions, which can include course failure.

Cell Phones and Laptops

Use of cell phones, laptop computers, or other electronic devices during class time for purposes other than taking notes or using class materials is prohibited. Students who use cell phones during class may be dismissed from the classroom for the remainder of the lecture.

In-Class Recordings

The Student Conduct Code (p. 13) prohibits students from "(m)aking a video recording, audio recording, or streaming audio/video of private, non-public conversations and/or meetings, inclusive of the classroom setting, without the knowledge and consent of all recorded parties," except in cases of approved disability accommodations. The Student Conduct Code also prohibits the "falsification or misuse, including non-authentic, altered, or fraudulent misuse, of University records, permits, documents, communication equipment, or identification cards and government-issued documents." Dissemination or sharing of any classroom recording without the permission of the instructor would be considered "misuse" and, therefore, prohibited. Violations of these policies may result in disciplinary action by the University. At the instructor's discretion, violations may also have an adverse effect on the student's grade.

Email and Internet Resources

Any important announcements will be sent to an email distribution list generated for this class. Each student is expected to have an active SCU email account and to check it regularly. **If you use an alternate email account, make sure to inform me.** Additionally, downloadable copies of all handouts, problem sets, exam keys, and other useful information will be available on a Google Site (<https://sites.google.com/a/scu.edu/ochem-carrasco/chem-33-organic-chemistry-iii>).

Standards

Chem 32 is a prerequisite for this course. A grade of C- or higher in Chem 32 is strongly recommended before taking Chem 33. **Students who received grades lower than C- are urged to meet with me before considering continuing in Chemistry 33.**

Pathways

Chemistry 33 may be associated with pathways in the future. If you declare a Pathway in these areas, you may use a representative piece of work from this course in the Pathway Portfolio you will complete during your senior year. It is recommended that you keep copies of your work.

Disability Accommodation Policy

If you have a documented disability for which accommodations may be required in this class, please contact Disabilities Resources, Benson 216, www.scu.edu/disabilities, as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through Disabilities Resources, please initiate a conversation with me about your accommodations during my office hours within the first two weeks of class. Accommodations will only be provided after I have verification of your accommodations as approved by Disabilities Resources, and with sufficient lead time for me to arrange testing or other accommodations. For more information you may contact Disabilities Resources at 408-554-4109.

Accommodations for Pregnancy and Parenting

In alignment with Title IX of the Education Amendments of 1972, and with the California Education Code, Section 66281.7, Santa Clara University provides reasonable accommodations to students who are pregnant, have recently experienced childbirth, and/or have medical needs related to childbirth. Pregnant and parenting students can often arrange accommodations by working directly with their

instructors, supervisors, or departments. Alternatively, a pregnant or parenting student experiencing related medical conditions may request accommodations through Disability Resources, as detailed in the section above.

Non-Discrimination Policy

Santa Clara University upholds a zero tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) have experienced discrimination or harassment, including sexual assault, domestic and dating violence or stalking, we encourage you to tell someone promptly. For more information on the University's Sexual and Gender-Based Misconduct Policy, please go to <http://bit.ly/2ce1hBb> or contact the University's EEO and Title IX Coordinator, Belinda Guthrie at 408-554-3043 or by email at bguthrie@scu.edu. Reports may be submitted online through www.scu.edu/osl/report or anonymously through Ethicspoint: www.scu.edu/hr/quick-links/ethicspoint/

Wellness Statement

Santa Clara University is a Jesuit Institution wherein the value of *cura personalis*, translated to care for the whole person, holds a place of incredibly high importance. Caring for oneself in both a physical and mental sense is paramount to a student's ability to live an enjoyable life at Santa Clara University, excel in academia, and reach their full potential in all aspects of their personhood.

- Students should always strive to get an appropriate amount of sleep each night; the recommended amount of sleep for adults ages 18-25 is 7-9 hours.
- Visit the Wellness Center's (currently located at 852 Market Street) website to see what resources are available on campus to aid and promote student well-being at <https://www.scu.edu/wellness/>.
- Students are given six free counseling sessions with Counseling and Psychological Services — it is highly encouraged you utilize these sessions should you find yourself in need of someone to talk to about anything at all. The number to make an appointment with CAPS is (408) 554-4501. Visit the Counseling and Psychological Services website to learn more about these sessions and more at <https://www.scu.edu/cowell/caps/>.
- If you are sick, please check in with your professor regarding your ability to attend class or lack thereof. By continuing to attend class while feeling sick, you are not only harming your own health, but likely the health of those around you as well. If you are feeling ill, we advise you visit Cowell Health Center during the operating hours of 8:30 am to 5:00pm, Monday through Friday. Visit the Cowell's center website to learn more about the various services this health center provides at <https://www.scu.edu/cowell/>.

CLASS SCHEDULE

<u>DAY</u>	<u>DATE</u>	<u>TOPIC</u>
M	Jul. 30	Review of carbonyl chemistry: Enols, Enolates, and Substitution Reactions; Enols and Enolates as Nucleophiles: Condensation Reactions
T	Jul. 31	Enols and Enolates as Nucleophiles: Condensation Reactions
W	Aug. 1	Conjugated Systems: Conjugate Addition Reactions and Diels-Alder Reaction
R	Aug. 2	Diels-Alder Reaction and Synthesis of Conjugated Systems; Review and Problems
F	Aug. 3	EXAMINATION I ; Free Radical Halogenation
M	Aug. 6	Benzene and Aromaticity; Aromatic Compounds: Electrophilic Substitutions
T	Aug. 7	Aromatic Compounds: Electrophilic Substitutions, Nucleophilic Substitutions
W	Aug. 8	Special Reactions of Aromatic Compounds; Electron-rich Aromatic Compounds
R	Aug. 9	Heterocycles; Review and Problems
F	Aug. 10	EXAMINATION II ; Dienes and UV spectroscopy
M	Aug. 13	The Chemistry of Amines; Transition Metal-Catalyzed Reactions: Suzuki, Heck, and Buchwald Coupling
T	Aug. 14	Amino Acids, Peptides, and Proteins
W	Aug. 15	Carbohydrates
R	Aug. 16	Review and Problem Solving
F	Aug. 17	FINAL EXAM