Chemistry 8 Organic Chemistry  
Fall 2014

Contact Information

Instructor: Roy K. Okuda, PhD
Office Location: Duncan Hall 9A (basement)
Telephone: (408) (924-2525)
Email: roy.okuda@sjsu.edu
Office Hours: Tues 3:00 to 4:30pm; Thurs 8:30 - 10:00am
Class Days/Time: Lecture MW 9:00 - 10:15am
Classroom: DH 250
Prerequisites: CHEM 001B (with a grade of "C" or better; "C-" not accepted).
Notes: CHEM 008 is not a satisfactory prerequisite for CHEM 112B. No credit toward Chemistry major or minor.

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas site associated with Chemistry 8. I will also use the email address listed on your mySJSU account regularly to send information on Chem 8. You are responsible for checking for messages on this email and the Chem 8 Canvas site on a regular basis to learn of any updates.

Course Description and Prerequisites

Introduction to the chemistry of carbon compounds for allied health majors and others requiring only 3 units of organic chemistry lecture. Prerequisite: CHEM 001B (with a grade of "C" or better; "C-" not accepted). Notes: CHEM 008 is not a satisfactory prerequisite for CHEM 112B. No credit toward Chemistry major or minor.

Chemistry 8 is designed to introduce you to organic chemistry in a one-semester course format. The intent of this course is to familiarize you with the basic concepts and properties of molecules based on carbon. An important goal of this course will be to link these basic principles with familiar organic compounds which may be encountered in other contexts. As you will see, organic chemicals impact many areas of your daily life!
Course Goals and Learning Objectives

Course Learning Outcomes (CLOs)

- Appreciation for the nature and scope of organic chemistry.
- Application of key concepts from general chemistry including electronegativity, bonding (ionic and covalent), hybridization of atomic orbitals, and molecular orbital theory to organic systems.
- Draw valence bond and Lewis dot structure for organic species, including formal charges.
- Draw skeletal structures for organic compounds.
- Apply acid-base concepts to organic systems; predict ordering of acid or base strength.
- Name alkanes, alkenes, polyenes, alkynes, alkyl halides, aromatic compounds, carbonyl compounds, amines and their various derivatives using systematic (IUPAC) nomenclature.
- Learn common names for some key chemicals.
- Draw reaction mechanisms for some key reactions.
- Recognize stereochemistry and be able to apply the Cahn-Ingold-Prelog system to designation of stereochemistry (E/Z or R/S).
- Learn many of the reactions of alkanes, alkenes, polyenes, alkynes, aromatic, carbonyl, and amine compounds, and close related species. Be able to predict reactions involving these functional groups.
- Be able to solve problems employing spectroscopic methods including mass spectrometry, infrared and NMR spectroscopy.
- Understand the basic chemical and structural features of biomolecules, including lipids, carbohydrates, amino acids and proteins, and nucleic acids.

Program Learning Outcomes (PLOs)

Chemistry 8 satisfies the following Undergraduate Program Learning Outcome for the Chemistry Department:

Program Learning Objective #2 - Demonstrate understanding of core concepts, methods and limits of scientific investigation to effectively solve problems in organic chemistry.

Required Texts/Readings

Textbook

Other Readings

Additional documents will be provided, usually posted on the Canvas site for this course.

Library Liaison

The Chemistry Library Liaison is Jennifer Dinalo (Jennifer.dinalo@sjsu.edu)

Course Requirements and Assignments

Catalog Description

Introduction to the chemistry of carbon compounds for allied health majors and others requiring only 3 units of organic chemistry lecture.

The scheduled time for this course is MW 9:00am to 10:15am in DH 250.

Tentative Course Calendar:

A tentative schedule for the semester appears at the end of this document. Note in particular the dates for the Hour Exams and the Final Exam.

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

NOTE that University policy F69-24, “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Attendance Policy

Beyond the initial day of class, attendance will not be taken. Attendance of the lectures is mandatory. If you miss a lecture, you are still responsible for all the material discussed in lecture (some of which may not be in the text). Note we will cover a significant amount of material during each class meeting. If you miss multiple class meetings, it will be
difficult to catch up due to the volume. Also, you are responsible for keeping up with any changes in the course or exam schedule, which otherwise will not be publicized outside of the lecture time. Please arrive promptly at 9:00am. A tentative lecture and course schedule is found at the end of this Greensheet.

Grading Policy

GRADING (see below for numerical breakdown and percentages)

Grading for Chem 8 will be assigned according to the following components:

Three Hour Exams (each worth 150pts) will be given during the semester - you are required to take 2 of them. If you take all 3, the lowest score of the 3 Hour Exams will not be counted. The final exam will be worth 200 points (this score can't be dropped). In summary, the calculation of your course points will be:

- 2 highest Hour Exams (150pts each) = 300pts
- Final Exam = 200pts
- Total points possible = 500pts

It is possible unannounced quizzes or assignments may be given. If so, these points will be added as bonus points to your total.

Grades will be assigned on a "+/-" system. The course grades will be assigned according the following ranges: 90-100% “A” range, 80-89% “B” range, 70-79% “C” range, 60-69% “D” range, 59% and below “F” range. Historically, these are the grade ranges I use, any modifications will be in your favor. Grades are assigned based on these ranges - I do not use "curves" to assign grades.

In most cases, a makeup exam will not be given if one Hour Exam is missed for any reason (that exam will be your score that isn't counted). If you miss a second exam, a makeup will only be considered in cases of verifiable emergencies, for example, an illness (provide a note from your doctor). In case of such an emergency, email me or contact me at 408-924-2525 immediately, or as soon as possible. If a makeup exam must be given, it will be a completely different exam than the one given to the class. It is strongly recommended that you take all 3 Hour Exams, but this policy allows you some flexibility if you have to miss one Hour Exam.

Note the dates of the Hour Exams and Final Exam now!

For security, final course grades are not posted, sent by email, or given over the phone. If you would like a breakdown of your 113A scores, leave a stamped and addressed envelope with me at the final exam.

Other Class Policies:
Audio Recording: audio (only) recording is allowed. Note I do not allow video recording. See also University Policies below.
Cell Phones: Out of courtesy, turn these off during lectures and exams.
Computers: You may use your laptop only during class lectures, as long as you can do so in a way that is not distracting to other students. Computers or any web-enabled devices are not allowed during exams.

Academic Integrity:

All work you submit for Chem 8 must be entirely your own effort. You are required to follow the rules provided when taking exams. No form of cheating, copying, use of unauthorized sources of information or other unfair advantage will be tolerated, and will be dealt with severely. A first infraction will result in “0 points” for that exam or exercise. A second will result in an automatic grade of "F" for the course. The underlying principle will be fairness to all students in the course.

See below for the University Policy on Academic Integrity (additional information can be found in the embedded link).

University Policies (following are policies from the University)

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester’s Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu Senate/docs/S12-7.pdf, requires students to obtain instructor’s permission to record the course.

• “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.” NOTE: video recording is not allowed for Chem 8. Audio recording is allowed.

• “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.”
Academic integrity

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Integrity Policy S07-2 requires approval of instructors.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC) at http://www.sjsu.edu/drc/ to establish a record of their disability.

•Emergencies and Building Evacuations

If you hear a continuously sounding alarm, or are told to evacuate the building by an Emergency Coordinator, walk quickly to the nearest exit (out the door and turn right to the stairwell to exit Duncan Hall - follow the instructions of the emergency coordinators). Take your personal belongings as you may not be allowed to return. Follow the instructions of the Emergency Coordinators. Be quiet so you can hear instructions. Once outside, move away from the building. Do not return to the building unless the Police or the Emergency Coordinator announces that this is permissible.

Following are resources that are available to all students. They may apply to this course as well as other courses you are taking.

Student Technology Resources

Computer labs for student use are available in the Academic Success Center at http://www.sjsu.edu/at/asc/ located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital
still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

**SJSU Peer Connections**

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit Peer Connections website at http://peerconnections.sjsu.edu for more information.

**SJSU Writing Center**

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the Writing Center website at http://www.sjsu.edu/writingcenter. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this code.)

**SJSU Counseling Services**

The SJSU Counseling Services is located on the corner of 7th Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or
psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit Counseling Services website at http://www.sjsu.edu/counseling.

Study Tips for Chem 8

Study Guide:

In Chem 8, we will cover a very broad range of material. Although we will not go into as much detail as the one-year Ochem courses (112A/112B), we still will cover much of the background and fundamental concepts important in organic chemistry. The material we cover will require a certain amount of memorization, but note that application of chemical principles will also be an important feature of this course (and the exams!). Thus, it is just as important to understand the underlying principles of a given problem, even if it seems to be a "memorization" problem, since there may be another one that will require you to apply your knowledge in order to arrive at an answer. Some other points to consider are:

1. Read the assigned chapter sections before coming to class. Much of the material covered in class will be based on the chapter readings, and the lecture will emphasize and illustrate what you have already read. If you know what is already in the book before the lecture, you will not have to spend your time copying down information which replicates what is in the text, but only new information that is described. This way, you will have the chance to really listen to the important points that are mentioned, and may avoid writer's cramp! Additionally, because of the volume of material we will have to cover, I may mention important points or reactions briefly in lecture, especially if I feel the book does a good job in describing the information. You are always responsible for the information assigned in the chapter readings, whether or not we spend a significant time on the topic in lecture. If the information is still unclear, ask me! It is also possible that I may add information and questions from the lecture that is not in the book (another reason why attendance is important!).

2. During the lecture, listen for important points and terms which will be emphasized, and highlight them in your notes for further study. As soon as possible after the lecture, look up these items and make sure you understand them. It will be a good idea to make a list summarizing these points. Periodically, pull out this list and refresh your memory on these points, referring to the textbook and notes, if necessary. This will be especially important as the semester progresses, and new material incorporates information that was covered earlier.

3. PROBLEMS, PROBLEMS, PROBLEMS!!! There is no substitute for the problems which are assigned in the schedule. Whether you decide to do them before or after the lecture is your choice, but you should keep up with the schedule, and not fall behind (don't wait until just before an exam to do the problems!). I suggest that you work on the problems immediately after each class. Working problems is extremely important in organic chemistry - you may understand the concepts from the book and lecture perfectly, but you must also show that you can apply them in the context of a problem for the exams.
4. Before an exam, review the material in the text and lecture notes. Use your summary list of key points and make sure you understand all of them, and can explain them without notes. Once again, do the assigned problems (and any others provided) and be sure you can work them without referring to notes. Work them alone and under conditions as if you are taking a real exam.

It is very important to keep up with the course on a lecture by lecture basis. The lectures may be boring and repeat what is in the book, but repetition and examples may help you really learn organic chemistry. Avoid waiting until just before an exam to “cram” in all the information you will need to know!

In addition to office hours, you are welcome to send me questions by email. However, these must be a reasonable number - if you have a large number of questions please come to my office hours. I may not be monitoring questions that come in over the weekends (note there are 2 exams on Mondays).

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter Title</th>
<th>Reading in Text*</th>
<th>Problems**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 25</td>
<td>Introduction Structure and Bonding</td>
<td>Chapter 1.1 to 1.5</td>
<td>1.1 – 1.9, 1.26-1.43</td>
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<tr>
<td>Aug 27</td>
<td>Structure and Bonding; Acid/Base</td>
<td>Chapter 1.6 to 1.12</td>
<td>1.10 – 1.25, 1.44 – 1.71</td>
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<td>Sept 3</td>
<td>Alkanes</td>
<td>Chapter 2.1 to 2.6</td>
<td>2.1 – 2.17, 2.29 – 2.51</td>
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<td>Sept 8</td>
<td>Alkanes 2</td>
<td>Chapter 2.7 to 2.11</td>
<td>2.18 – 2.28, 2.52 – 2.74</td>
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<tr>
<td>Sept 10</td>
<td>Alkenes &amp; Alkynes</td>
<td>Chapter 3.1 to 3.9</td>
<td>3.1 – 3.63</td>
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<td>Sept 15</td>
<td>Reactions of Alkenes and Alkynes</td>
<td>Chapter 4.1 to 4.6</td>
<td>4.1 – 4.10, 4.21 – 4.32</td>
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<td>Sept 17</td>
<td>Reactions of Alkenes and Alkynes 2</td>
<td>Chapter 4.7 to 4.11</td>
<td>4.11 – 4.20, 4.33 – 4.68</td>
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<tr>
<td>Sept 22</td>
<td>Aromatic Compounds</td>
<td>Chapter 5.1 to 5.6</td>
<td>5.1 – 5.12, 5.21 -5.49</td>
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<tr>
<td>Sept 24</td>
<td><strong>Hour Exam 1</strong> Lect: Aromatic Compounds 2</td>
<td>Chapter 5.7 to 5.10</td>
<td>(exam given in first 60min)</td>
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<td>5.13 – 5.20, 5.50 – 5.62</td>
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<tr>
<td>Sept 29</td>
<td>Stereochemistry</td>
<td>Chapter 6.1 to 6.6</td>
<td>6.1 – 6.16, 6.21 – 6.50</td>
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<td>Oct 1</td>
<td>Stereochemistry 2</td>
<td>Chapter 6.7 to 6.10</td>
<td>6.17 – 6.20, 6.51 – 6.66</td>
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<td>Oct 6</td>
<td>Chirality</td>
<td>Chapter 7.1 to 7.6</td>
<td>7.1 – 7.15, 7.20 – 7.42</td>
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<td>Oct 8</td>
<td>Chirality 2</td>
<td>Chapter 7.7 to 7.10</td>
<td>7.16 – 7.19, 7.43 – 7.66</td>
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<td>Oct 13</td>
<td>Alcohols, Phenols, Ethers</td>
<td>Chapter 8.1 to 8.8</td>
<td>8.1 – 8.68</td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Chapters</td>
<td>Notes</td>
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<td>Oct 22</td>
<td>Carboxylic Acids &amp; Derivatives</td>
<td>Chapter 10.1 to 10.8</td>
<td>10.1 – 10.17, 10.28 – 10.45</td>
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<tr>
<td>Oct 27</td>
<td><strong>Hour Exam 2</strong></td>
<td>Chapter 10.9 to 10.13</td>
<td>(exam given in first 60min) 10.18 - 10.27; 10.45 - 10.75</td>
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<td>Lect: Carboxylic Acids &amp; Derivatives 2</td>
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<td>Oct 29</td>
<td>a-Carbonyl Reactions</td>
<td>Chapter 11.1 to 11.6</td>
<td>11.1-11.11, 11.22 – 11.39</td>
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<td>Nov 3</td>
<td>a-Carbonyl Reactions 2</td>
<td>Chapter 11.7 to 11.11</td>
<td>11.12 – 11.21, 11.40 – 11.60</td>
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<td>Nov 5</td>
<td>Amines</td>
<td>Chapter 12.1 to 12.7</td>
<td>12.1 - 12.60</td>
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<td>Nov 12</td>
<td>Structure Determination 2</td>
<td>Chapter 13.6 to 13.10; handouts on Canvas</td>
<td>13.10 – 13.18, 13.25, 13.45 – 13.51</td>
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<td>Nov 19</td>
<td>Carbohydrates</td>
<td>Chapter 14.1 to 14.11</td>
<td>14.1 – 14.62</td>
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<td>Nov 24</td>
<td><strong>Hour Exam 3</strong></td>
<td>Chapter 15.1 to 15.6</td>
<td>(exam given in first 60min) 15.1 – 15.14, 15.18 – 15.34</td>
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<td>Lect: Amino Acids, Peptides, Proteins</td>
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<tr>
<td>Nov 26</td>
<td>Amino Acids, Peptides, Proteins</td>
<td>Chapter 15.7 to 15.10</td>
<td>15.15 – 15.17, 15.35-15.59</td>
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<td>Dec 1</td>
<td>Lipids and Nucleic Acids</td>
<td>Chapter 16.1 to 16.11</td>
<td>16.1 – 16.13, 16.21 – 16.40</td>
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<td>Dec 3</td>
<td>Natural Products</td>
<td>handout</td>
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<td>Dec 8</td>
<td>Metabolic Pathways</td>
<td>Chapter 17.1 to 17.6</td>
<td>17.1 - 17.41</td>
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<td>Dec 10</td>
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**Dec 16, 2014**  **FINAL EXAM: 7:15am to 9:30am**

*In addition, topics which are not found in the McMurry text will be covered in the lectures.

**Additional problems will be provided in class or posted on Canvas.*