CHEM 112A
Organic Chemistry Lecture = Section 02
San Jose State University
Fall 2013
TR 3:00-4:15; SCI-164

Dr. Daniel Straus
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email: dastraus@email.sjsu.edu
Office phone (408)924-4998
Hours: Tu 11:15-12:30
We 09:30-10:15
Th 4:30-5:30
Or by prior appointment

Prerequisite: Chem 1B with a grade of “C” or better (“C-“ not accepted). Students who have completed Chem 8 will receive reduced credit for this course.

Required:
• McMurry, Organic Chemistry (8th ed. Special for Chem 112A and B at SJSU)
  Bundled with: Weeks, Pushing Electrons (3rd ed.)
• A set of molecular models.
• Student photo-ID card at all exams (see below)

Course Description: [Catalog: “Chemistry of the carbon compounds, both aliphatic and aromatic, emphasizing underlying concepts.” 3 units]. This course provides the student with working background knowledge of fundamental concepts of organic chemistry including structure and bonding, stereochemistry, nomenclature, fundamentals of reaction mechanisms, and with familiarity with several classes of organic compounds. Emphasis will be placed on the application of concepts introduced, particularly as applied to reaction mechanisms. Although a good memory is helpful, rote memorization is not the key to this course.

Organization: The sequence of topics in the text will be followed unless stated otherwise. Schedule handouts will be distributed in class giving tentative dates for reading assignments and exams. Problem assignments will be given but will not be collected. A sampling of key problems will be assigned, however you are encouraged to work all of the problems in the text; some problems on the exams will be taken from the text. Because the course is built up in a cumulative manner, material from the first chapters will be important to understanding later chapters. It is therefore important not to fall behind. You should seek help with material you may be having trouble with as you go along rather than deferring it until right before an exam. While the ordering of topics covered will in general follow the text, some additional material may be introduced in lecture and then covered on the exams. Since not all the test subject matter will be covered in the book you are expected to attend all class sections.
Learning Objectives:

• 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 structures 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 and their various derivatives using systematic (IUPAC) nomenclature.
• Learn common names for some key chemicals.
• Use bond dissociation energies (BDE’s) to calculate reaction energetics.
• Draw reaction mechanisms for polar and radical processes.
• Recognize stereochemistry and be able to apply the Cahn-Ingold-Prelog system to designation of stereochemistry (E/Z or R/S).
• Apply stereochemistry to determination of reaction mechanism.
• Understand the fundamentals of reaction kinetics and be able to apply to determination of reaction mechanism.
• Learn many of the reactions of alkanes, alkenes, polyenes, alkynes, aromatic compounds, and closely related species. Be able to both predict products and, in many cases, provide probable reaction mechanisms.
• Employ the reactions learned in designing multistep organic synthesis.
• Learn and be able to apply the material presented in Chapters 1-11 and 14-16 in the text as well as topics introduced in lecture.

Grading: The grading scheme is tentative but will probably consist of three midterm exams (100 points each) and a comprehensive final exam (250 points). You are only required to take two of the three midterms. Individual make-up exams will not be given. Letter grades [according to the University policy: A(+/-) = excellent; B(+/-) = above average; C(+/-) = average; D(+/-) = below average; F = failure] will be assigned to each exam score and the course grade will be a weighted average of the letter grades. The lowest of the three midterm grades (or the one not taken) will be dropped and replaced with an average of the two higher midterm grades. (Exception: If a grade of fail is assigned to an exam due to academic dishonesty, the fail grade will be retained and the middle exam grade will be discarded).

Exams: These are closed book and absolutely no-notes. You may use molecular models (without instructions). Calculators, cell phones, and other electronic devices are prohibited and may not be on your person during the exam (these may be left at the front of the room or left at home). I reserve the right to assign your seat as I see fit; even to reassign seats during an exam. Makeup exams will not be offered. You may only take the exam in the section for which you are officially enrolled. If you believe there has been a grading error, please bring it to my attention within two calendar weeks after the exam has been returned; no regrades will be done after this period.
Final Exam Notification: Final exam grades will not be posted. Your grade will be entered on MySJSU as soon as possible. However, this is your composite course grade only, of course. If you wish to know how you scored on the final exam, please provide me with a stamped, self-addressed envelope at the final exam period, and I will mail your final exam score and grade to you as soon as possible. Otherwise, please drop by office hours next semester.

Grades will not be given out by email, and I will not be available during the intersession (between semesters; winter or summer) to report or discuss grades.

Academic Integrity: “Your own commitment to learning, as evidenced by your enrollment at San Jose State University, and the University’s Academic integrity Policy requires you to be honest in your academic course work. Faculty are required to report all infractions to the Office of Student Conduct and Ethical Development. The policy on academic integrity can be found at http://sa.sjsu.edu/student_conduct.

Campus policy in compliance with Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me or see me during office hours as soon as possible, but certainly within the first two weeks of the semester. Presidential Directive 97-03 requires that students with disabilities register with EAC to establish a record of their disability. Because special test accommodations require forms and careful record keeping I will not do these "on-the-fly" at the end of lecture. You need to see me in office hours, or if that is not possible, schedule an appointment. EAC forms must be filled out and signed by me at least one calendar week before the exam in question.

Drop Policy: University Policy will be followed. After the free drop period, documentation of serious and compelling reasons will be required for all drops. See the following for details: http://www.sjsu.edu/sac/.

Add Code (Permission Number) Policy: Any add code (“permission number”) given out must be used prior to the next class meeting or it will be given to another deserving student should the class be impacted (i.e., full).

Posted Materials: Keys to exams will be posted in the hallway outside S-164 only until the next test date. Be sure to record any correct answers you wish during that period, since these keys will not be available later.

Student ID: At all exams, you must bring student photo ID. You should show up early, as those who come late to exams will have to wait outside until all others are started.

Chemical Safety: Chem 120S is a required course for all chemistry majors and a prerequisite for all Chem 180/298 research.
Final Exam (regular SJSU time slot): Monday, December 16, 1445-1720.

_Tentative_ Midterm Exam Dates: These are subject to change - any changes will be announced in lecture. It is expected you will attend all lecture sections.

Exam 1: Tuesday, September 24

Exam 2: Thursday, October 24

Exam 3: Tuesday, November 19

_Sample Grade Calculation:_

Midterm 1 = B+ (3.3)

Midterm 2 = C (2.0)

Midterm 3 = A- (3.7)

Final Exam = A (4.0)

Throw out low midterm; midterm average = \((3.3 + 3.7)/2 = 3.5\)

Course Grade = \((3.5)\text{•}(300/550) + (4.0)\text{•}(250/550) = 3.73 = A-\)

_Cutoffs:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Cutoff</th>
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<tbody>
<tr>
<td>A+</td>
<td>4.15</td>
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<tr>
<td>A</td>
<td>3.85</td>
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<tr>
<td>A-</td>
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<tr>
<td>B+</td>
<td>3.15</td>
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<tr>
<td>B</td>
<td>2.85</td>
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<tr>
<td>B-</td>
<td>2.50</td>
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<tr>
<td>C+</td>
<td>2.15</td>
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<tr>
<td>C</td>
<td>1.85</td>
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<tr>
<td>C-</td>
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<td>D+</td>
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<tr>
<td>D</td>
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**Schedule - Part I**

Chem 112A - Section 01 and 02 (TR)
Straus, Fall 2013

<table>
<thead>
<tr>
<th>Week Beginning</th>
<th>Reading**</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 19</td>
<td>1: §1-6</td>
</tr>
<tr>
<td></td>
<td>(No Classes Meet Tuesday 8/20)</td>
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<tr>
<td>August 26</td>
<td>1: §7-12</td>
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<td></td>
<td>2: §1-9</td>
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<tr>
<td>September 2</td>
<td>2: §10-13 and 3: §1-5</td>
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<tr>
<td>September 9</td>
<td>3: §6,7 and 4: §1-3</td>
</tr>
<tr>
<td>September 16</td>
<td>4: §4-9</td>
</tr>
<tr>
<td></td>
<td>5: §1-5</td>
</tr>
<tr>
<td>September 23</td>
<td>Tuesday September 24 -- EXAM 1: Ch. 1, 2, 3 &amp; 4</td>
</tr>
<tr>
<td></td>
<td>5: §6-11</td>
</tr>
</tbody>
</table>

**Assigned Problems:**

1: 1-19; 22-35; 37; 38; 40-42; 44; 46; 48; 49; 52-54  
2: 1-3; 5-17; 19; 20; 24; 25; 27; 29; 31-38; 41; 43-47; 49; 51; 53-56; 58  
3: 1-32; 34-40; 42; 46; 47; 50; 52  
4: 1-7; 12-16; 18; 19; 21; 22; 25; 27-34; 37; 38; 42-45; 48; 52; 54; 56  
5: 1; 2; 4; 7-15; 17; 19-23; 25-31; 33; 40

** The above schedule is tentative; it is intended to give the student a rough idea of the pace of the class. Specific items, including exam dates and exam topics are subject to change. Any changes with regard to exams will be announced in class well in advance, although such changes are unlikely. Lecture topics/dates often will deviate somewhat from the reading schedule in order to allow flexibility in coverage of topics according to the interests and abilities of the class. You are encouraged to do your reading in advance of the lecture.
# Schedule - Part II

Chem 112A - Section 01 and 02 (TR)
Straus, Fall 2013

<table>
<thead>
<tr>
<th>Week Beginning</th>
<th>Reading**</th>
</tr>
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<tbody>
<tr>
<td>September 23</td>
<td>Tuesday September 24 -- <strong>EXAM 1</strong>: Ch. 1, 2, 3 &amp; 4</td>
</tr>
<tr>
<td></td>
<td>5: § 6-11</td>
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<tr>
<td>September 30</td>
<td>5: § 6-11 and 6: § 1-7</td>
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<tr>
<td>October 7</td>
<td>6: § 7-11 and 7: § 1-8</td>
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<td>October 14</td>
<td>7: § 9,10</td>
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<tr>
<td></td>
<td>8: § 1-9</td>
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<tr>
<td>October 21</td>
<td>Review and Introduce Ch. 9</td>
</tr>
<tr>
<td>October 28</td>
<td><strong>EXAM 2</strong>: Ch. 5, 6, 7 &amp; 8</td>
</tr>
<tr>
<td></td>
<td>9: § 1-8</td>
</tr>
</tbody>
</table>

### Assigned Problems:

- **5**: 1; 2; 4; 7-15; 17; 19-23; 25-31; 33; 40
- **6**: 1-16; 18; 19; 23-27; 29; 30; 33-37; 39-43; 45; 47-52; 57; 58
- **7**: 1-19; 24-31; 34; 36; 41; 42; 44-46; 48; 50; 51; 53; 55; 57
- **8**: 1-6; 8-13; 17-36; 38; 39; 45
- **9**: 1-4; 7-13; 15-17; 19-22; 24; 25; 29; 31; 35-51; 53-55; 57; 58; 65; 73; 78; 79; 81
- **10**: 1-3; 5-10; 12; 13; 17-20; 22-24; 26-28; 30-33; 35-37; 39

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Schedule - Part III
Chem 112A - Section 01 and 02 (TR)
Straus, Fall 2013

Week Beginning       Reading**
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October 21          Review and Introduce Ch. 9
                     Thursday October 24 - EXAM 2: Ch. 5, 6, 7 & 8
October 28          9: § 1-11, 12, 14
November 4           10: § 1-9
                     11: § 1-5
November 11          11: § 6-12
                     14: § 1-6
November 18          15: § 1-8
                     Tuesday November 19 - EXAM 3: Ch. 9, 10, 11 & 14
November 25          16: § 1-5 (No class 11/28 – Thanksgiving)
December 2           16: § 6-11 and Review

FINAL EXAMINATION - STUDENT ID REQUIRED – SEE UNIVERSITY CALENDAR FOR YOUR SECTION.

Assigned Problems:

9: 1-4; 7-13; 15-17; 19-22; 24; 25; 29; 31; 35-51; 53-55; 57; 58; 65; 73; 78; 79; 81
10: 1-3; 5-10; 12; 13; 17-20; 22-24; 26-28; 30-33; 35-37; 39
11: 1-8; 10-13; 15-17; 20; 21; 25-28; 30; 33-52; 54; 57; 58; 60; 61
14: 1-9; 20-22; 24-27; 29; 32; 50
15: 1-4; 6-8; 11-13; 18-20; 22; 25; 26; 30-33; 35-37; 40
16: 1-11; 13-15; 17; 20-24; 29-32; 34-40; 43; 45-54; 57; 60; 62-64; 67

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