

# CHEMISTRY 124

## Organic Chemistry II – Spring 2014

Mon, Wed, Fri 8:00 – 8:50 SQU 316

**Instructor** Dr. John D. Spence (www.csus.edu/indiv/s/spencej/)

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**Office Hours** Wednesdays 4:00-5:00 and Fridays 9:00-11:00

**Text** Lecture text for this course is optional. The following texts/resources may be useful for you in this course:

1. *Organic Chemistry*, Solomons, 10<sup>th</sup> Edition
2. *Organic Chemistry*, McMurry, 7<sup>th</sup> Edition
3. Virtual Text in Organic Chemistry:  
<http://www.cem.msu.edu/~reusch/VirtualText/intro1.htm>
4. *Organic Chemistry II as a Second Language*, Kline
5. *Preparing for your ACS Examination in Organic Chemistry* (ISBN: 0-9708042-1-0)

**Grading** Your grade for the course will be based on your top three exam scores (total of four exams administered) and the course final. Each of the four mid-term exams are worth 125 points. The final exam is a standardized, cumulative exam (covering chem 24 and 124) written by the American Chemical Society worth 200 points. Exam dates are listed in the tentative course schedule. Students caught cheating on any assignment will receive a score of zero for that assignment. If a student is caught cheating a second time they will fail the course. No late or make-up exams will be given. If you miss an exam it will automatically become the exam score you drop. A second missed exam will receive a zero.

<u>Point Distribution</u>		<u>Grade Scale</u>	
Exams:	375 points	A to A <sup>-</sup>	100-88%
<u>Final Exam:</u>	<u>200 points</u>	B <sup>+</sup> to B <sup>-</sup>	87-76 %
		C <sup>+</sup> to C <sup>-</sup>	75-63%
Total:	575 points	D <sup>+</sup> to D <sup>-</sup>	62-52%
		F	below 52%

**Homework** At the end of lectures relevant homework problems will be assigned to test your understanding of the material presented. No homework will be collected or graded, however, I am willing to check/discuss your answers in office hours. Correct answers to problem sets will be posted a week before exam dates.

### **Course Description**

The course is a continuation of organic chemistry and will build on your knowledge of spectroscopy, reactivity of organic molecules, reaction mechanisms, and the syntheses of organic compounds. It will be expected that you have a strong grasp of the material covered in the first semester of the organic sequence, therefore, it is to your advantage to review some of these key concepts: Lewis structures, resonance, hybridization, pK<sub>a</sub>'s, electrophilic and nucleophilic sites, using curved arrows to depict reaction mechanisms, performing multistep syntheses, IR spectroscopy. Successful completion of Chem 24 (C- or higher) is required for enrollment in the course.

<i>Tentative Course Schedule</i>			
<i>Week</i>	<i>Assignment</i>	<i>Topics</i>	<i>Solomons Text</i>
1-27		Course Intro. NMR Spectroscopy 1H NMR Spectroscopy: theory, chemical shift, atom equivalence 1H NMR Spectroscopy: 1H NMR, integration, coupling	Ch 9 Ch 9 Ch 9
2-3		13C NMR Spectroscopy NMR Spectroscopy: Problem Solving; Conjugated Alkenes Conjugated Alkenes: preparation and reactivity	Ch 9 Ch 9 Ch 13
2-10		Conjugated Alkenes: reactions, Diels-Alder reaction Aromaticity: structure, naming Aromaticity: Huckel's rule, ions	Ch 13 Ch 14 Ch 14
2-17		Aromaticity: heterocycles and polycycles Aromaticity: five electrophilic aromatic substitution reactions Aromaticity: substituent effects in electrophilic aromatic substitution	Ch 14 Ch 15 Ch 15
2-24	<b>Exam 1</b>	<b>Exam 1: Monday Feb 24<sup>th</sup></b> NMR, conjugated alkenes, Aromaticity Aromaticity: electrophilic and nucleophilic substitution Aromaticity: side chain reactions	Exam 1 Ch 15, 21 Ch 15
3-3		Alcohols: nomenclature, properties, preparation Alcohols: preparation and reactions Alcohols: reactions	Ch 11 Ch 11, 12 Ch 11, 12
3-10		Ethers: naming, properties, preparation Ethers: reactions. Epoxides: preparation and reactions Epoxides: reactions	Ch 11 Ch 11 Ch 11
3-17		Ald and Ket: naming, preparation, reactions Ald and Ket: nuc addition (H <sub>2</sub> O, HCN, RMgBr, hydride)	Ch 16 Ch 16
	<b>Exam 2</b>	<b>Exam 2: Friday Mar 21<sup>st</sup></b> . Aromatic reactions, alcohols, ethers, exam 1	Exam 2
3-24		<b>No Class - Spring Break</b>	
3-31		<b>No Class Cesar Chavez Holiday</b> Ald and Ket: reactions (Wittig, BV, Cannizzaro). Enones Ald and Ket: nuc addition – acetals, imines and enamines	Ch 16 Ch 16
4-7		Acids & Derivs: preparation, structure and reactivity Acids & Derivs: general mechanisms, hydrolyses Acids & Derivs: interconversion between acid derivatives	Ch 17 Ch 17 Ch 17
4-14		Acids & Derivs: hydride and Grignard addition Acids & Derivs: multi-step syntheses and nomenclature Catch-up and Problem Solving	Ch 17 Ch 17, 24
4-21	<b>Exam 3</b>	<b>Exam 3: Monday April 21<sup>st</sup></b> . Ald./Ket, Acids & Derivatives, exam 2 $\alpha$ -Sub: enols, enolates, alpha halogenation $\alpha$ -Sub: alpha halogenation, alpha alkylation	Exam 3 Ch 18 Ch 18
4-28		$\alpha$ -Sub: alpha alkylation Carbonyl Condensations: Aldol reaction Carbonyl Condensations: mixed and intramolecular Aldols	Ch 18 Ch 19 Ch 19
5-5		Carbonyl Condensations: Claisen reaction Carbonyl Condensations: mixed and intramolecular Claisen reaction Carbonyl Condensations: additional reactions	Ch 19 Ch 19 Ch 19
5-12	<b>Exam 4</b>	<b>Exam 4: Monday May 12<sup>th</sup></b> . $\alpha$ -Subs and Condensations, exam 3 Amines: naming, basicity, preparation, reactions Course Review	Exam 4 Ch 20 Review
***		<b>FINAL EXAM Monday May 19<sup>th</sup> 8:00 – 10:00 a.m.</b>	***