

**CHEM 242 Organic Chemistry II
Course Syllabus – Summer 2013-14**

Course Objectives: Individuals who successfully complete this course will be able to:

1. Name and draw correct structural representations of organic molecules.
2. Apply organic chemistry theory to explain physical property and chemical reactivity of organic molecules.
3. Write reasonable transformations and mechanisms for organic compounds.
4. Elucidate structures of organic molecules from spectral data.
5. Design syntheses for organic molecules with reasonable complexities and sizes.

Course Description: This course is a continuation of CHEM 241. It covers structure, reactivity, and stereochemistry of organic compounds, especially alkynes, alcohols, ethers, dienes, and aromatic compounds. IR, MS, UV, and NMR spectral techniques are introduced and applied to the identification of organic compounds.

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Lectures: Two sessions/week in Disque 108; 12 to 1:50 pm, Wednesdays and Fridays. No class on Friday, July 4th (University Holiday).

Textbook: *Organic Chemistry*, 8th edition, by L. G. Wade, Jr.; *Solutions Manual* by Jan William Simek. Both books are on reserve in Hagerty Library.

Exams and Grading: Two in-class exams: the first one (worth 20% of the final grade) will take place on *Friday, July 18th*; the second one (worth 30% of the final grade) will take place on *Friday, August 8th*. The final exam is a two-hour, cumulative exam that is worth 50% of the final grade. A number of take-home quizzes will be given during the term. The quizzes are intended for self-evaluation and are not part of the final grade. However, those who do well on quizzes and also have an excellent record of class attendance will receive bonus points. Active participation in in-class discussions is another way to earn bonus points. If you require extra time for a written exam because of a disability, please contact Prof. Jun Xi at least seven days prior to the exam with an AVL. No make-up exams or quizzes will be given except for the absence due to a medical emergency.

Course Website: Course materials such as quizzes, practice exams, handouts will be posted in Blackboard Learn once they become available. However, lecture notes, except lecture outlines (not full notes) for chapters 12 and 13 (IR, MS and NMR), will not be posted.

Academic Honesty: It is expected that students will maintain the highest standards of academic honesty. Information regarding the academic integrity policy can be found at the following link: http://drexel.edu/studentaffairs/community_standards/studentHandbook/.

Study Tip: Understanding organic chemistry principles by paying attention during lectures, reviewing lecture notes and course handouts, and reading the textbook. Learning how to apply the principles to solve problems by doing the homework assignments. Exams and quizzes are based on lecture materials and study problems in the textbook. Utilizing available resources such as practice exams, study guide, and review sessions to be familiar with the test format and emphasis.

Homework assignment: Homework will not be collected.

Chapter 9

Reading: Chapter 9 (Alkynes).

Additional reading: Chapter 1 to 8, focus on the following subjects: resonance, bond length and bond angle, acidity and basicity (structural effect), boiling point and melting point, stereochemistry, reaction energy diagram, nomenclature of alkanes and alkenes, relative stabilities of reaction intermediates (carbocations, free radicals, carbanions, carbenes), nucleophilic and electrophilic reaction mechanisms (S_N2 , S_N1 , E_2 , and E_1), reactions of alkanes and alkenes, and drawing reaction mechanism.

Study Problems: Chapter 9: 2, 4-9, 12, 13, 15, 16, 18-21, 23-37.

Chapter 10

Reading: Chapter 10 (Structure and Synthesis of Alcohols).

Study Problems: Chapter 10: 1-2, 4-8, 13-17, 19, 23-28, 30, 31, 32(a, b), 33-37, 38(a to n), 39-44, 51.

Chapter 11

Reading: Chapter 11 (Reactions of Alcohols).

Study Problems: Chapter 11: 1, 2, 4 (1 and 2), 5 (1 and 2), 9, 11, 14-17, 19-22, 26-30, 32, 37, 38, 42, 44, 45, 47-50, 55, 56(a-g), 57-59.

Chapter 12

Reading: Chapter 12 (Infrared Spectroscopy and Mass Spectrometry).

Additional reading: p633-634 (IR and MS of ethers); p743-744 (IR and MS of benzenes); p822-823 (IR of ketones and aldehydes); p824-827 (MS of ketones and aldehydes); p891-892 (IR of amines); p894-895 (MS of amines); p952-953 (IR of carboxylic acid); p955-956 (MS of carboxylic acid).

Study Problems: Chapter 12: 2-11, 14-20, 23-28; Chapter 14: 7; Chapter 18: 3 and 4; Chapter 19: 7 and 10; Chapter 20: 7, 9 and 10.

Chapter 13

Reading: Chapter 13 (Nuclear Magnetic Resonance Spectroscopy).

Additional reading: p634 (NMR of ethers); p743-744 (NMR of benzenes); p823-824 (NMR of ketones and aldehydes); p893-894 (NMR of amines); p953-954 (NMR of carboxylic acid).

Study Problems: Chapter 13: 1-4, 6-8, 10-15, 18, 21, 24, 28-38, 40, 42-44, 47, 49, 51, 52, 54; Chapter 18: 2; Chapter 19: 8 and 9; Chapter 20: 8.

Chapter 14

Reading: Chapter 14 (Ethers, Epoxides, and Sulfides).

Study Problems: Chapter 14: 1, 4, 6, 9-18, 20-23, 25-42, 45-49.

Chapter 15

Reading: Chapter 15 (Conjugated Systems, Orbital Symmetry, and Ultraviolet Spectroscopy) and Chapter 2 (Structure and Properties of Organic Molecules, p42-59).

Study Problems: Chapter 15: 1, 2, 4-23, 25-34, 36, 37.

Chapter 16

Reading: Chapter 16 (Aromatic Compounds).

Study Problems: Chapter 16: 7, 8, 9(a, b), 10-12, 15-17, 19, 21, 23, 24, 26, 27, 29, 30, 32, 34-36, 41-43, 48.