

CHEM 242 Organic Chemistry II
Course Syllabus – Winter 2013-2014

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.

Instructor: Professor Jun Xi. Office: Disque 218. Telephone: 215-895-2648.

E-mail: jx35@drexel.edu. Office hours: By appointment. Tutoring hours: TBA.

Lectures: Three sessions/week in CAT 61; 9 to 9:50 am, Mondays and Wednesdays; 9 to 10:50 am, Fridays. No class on January 20th (Martin Luther King, Jr. Day).

Textbook: *Organic Chemistry*, 8th edition, by L. G. Wade, Jr.; *Solutions Manual* by Jan William Simek.

Exams and Grading: Two in-class exams: the first one worth 20% of the total, will take place on *Wednesday January 29th*; the second one worth 30% of the total, will take place on *Wednesday February 19th*. The final exam is a two-hour, cumulative exam that is worth 50% of the total. A number of take-home quizzes will also be given during the term. The quizzes are intended for self-evaluation and are not part of final grades. However, bonus points will be given to those who do well in quizzes, have a good record of class attendance, and actively participate in class discussions. 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.

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: Study the practice exam, review the lecture notes, read the textbook, and do the homework assignments. Exams and quizzes are based on lecture materials and study problems in the textbook.

Homework assignment: Homework will not be collected.

Chapter 9 (May Skip)

Reading: Chapter 9 (Alkynes).

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).

Additional reading: Chapter 1 to 9, 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, alkenes and alkynes, 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, alkenes and alkynes.

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.

Chapter 17 (Time Permitting)

Reading: Chapter 17 (Reactions of Aromatic Compounds).

Study Problems: Chapter 17: 2, 3, 5, 8, 10-20, 23, 24, 26, 27, 34, 37, 40, 42, 44, 46-48, 51, 52, 54, 56, 57, 69.