

California State University, Dominguez Hills
Department of Chemistry
ORGANIC CHEMISTRY II
General Information–Spring 2011

Course

CHE 312-01, 3 units

Meeting

MWF 10:00 to 10:50 a.m. in room NSM C-213

Materials:

- text: *Organic Chemistry*, 6th edition, by R.T. Morrison and R.N. Boyd.
- Study Guide to text
- prepared lecture notes with outlines
- binder for storing notes, handouts, and problems

Instructor

Dr. Sofia Papatheodorou

Office Hours

M., 11:15 a.m.–12:15 p.m.; W. 11:15 a.m.–12:15 p.m.; Th. 10:00 –12:00 p.m.; and by request

Faculty Office

NSM B-316, (310) 243-3384

Research Laboratory

NSM B-324, (310) 243-3425

Department Office

NSM B-202, (310) 243-3376

E-mail

sofia (“at” symbol) csudh.edu

Policy

Objectives and Regulations

This course is the second half of the Organic Chemistry year-long lecture courses for chemistry majors and pre-health professionals. One year of General Chemistry and the first half of Organic Chemistry lecture and laboratory are prerequisite. Simultaneous enrollment in Organic Chemistry II Laboratory (CHE 313) is required, except by permission.

Course Description

This course is organized around a functional group approach in which molecules with specific structural groups are classified in families. Aromatic compounds and spectroscopy will be studied, and initially applied to the families of compounds already covered in the first half of Organic Chemistry. Then both the aliphatic and aromatic compounds of the following families will be studied: carbonyl compounds, carboxylic acids and derivatives, carbanions, amines, phenols, and aryl halides. Topics to be covered in these families of compounds include molecular structure, nomenclature, physical and chemical properties, isomerism, reactions, mechanisms, stereochemistry, and spectroscopy. The selection and rigor of the material is consistent with the professional chemistry major as certified by the American Chemical Society and is suitable for chemists, chemical engineers and pre-health professionals. Relationships and applications of organic chemistry to our world are drawn

wherever possible, including to the life sciences, health and medicine, agriculture, consumer goods, energy and the environment. Awareness is fostered of ethical, social, and practical implications of these relationships and applications to the world. The magnificence of the detailed structure and exactness of animate and inanimate matter are revealed.

Teaching Methods

Interactive lecture presentations will be given utilizing an overhead projector and will follow the prepared outlines and detailed notes delineating the material in the text and emphasizing the important concepts. Class discussions will include diagrams, graphs, analysis of tables of data, demonstrations using molecular models, and procedures for solving textbook exercises. The Study Guide contains answers and detailed explanations to all textbook problems, and an AMP workshop in Organic Chemistry is being offered six hours per week conducted by an advanced student facilitator. The laboratory component of this course is a separate course with its own syllabus, schedule and requirements.

Learning Outcomes

After completing this course the student should be able to:

- 1) recognize and explain the differences in properties and reactivity between the two major divisions of hydrocarbons, aromatic and aliphatic, and how these differences influence the other compounds that will be studied.
- 2) demonstrate knowledge of the various spectroscopic techniques used for identifying (and often quantifying) organic compounds.
- 3) interpret the spectra of organic compounds obtained by the various spectroscopic methods.
- 4) recognize the characteristic structures of the new classes of organic compounds studied
- 5) apply to these classes of organic compounds all the methods utilized in the previous organic chemistry course for representing organic molecules, their bonding, and their structural and stereoisomers.
- 6) name the organic compounds by the IUPAC System, the Common System, and by any special names; apply the correct priority order of the functional groups in naming the compounds.
- 7) interpret the physical properties of the organic compounds.
- 8) demonstrate knowledge of the methods for preparing the classes of organic compounds studied.
- 9) demonstrate knowledge of the reactions of these classes of organic compounds.
- 10) write out the mechanisms of several important reactions.
- 11) distinguish between electrophilic and nucleophilic substitution reactions and the respective mechanisms followed.
- 12) distinguish between nucleophilic and electrophilic addition reactions and the respective mechanisms followed.
- 13) distinguish between reactions involving carbanion and carbocation intermediates and the respective mechanisms followed.
- 14) arrange in order the acid/base strengths of the organic compounds and of some relevant inorganic compounds.

Course Schedule and Attendance

Topics and chapters to be covered are listed on the schedule sheet. Class attendance is strongly recommended and is mandatory for exams. Students are responsible for all class information and notes.

Reading Assignments

Students should read the chapters listed on the schedule sheet before class discussion and review them carefully afterwards, together with the class notes and outlines. Students are responsible for all the material, especially that included in the notes, unless stated otherwise in class.

Problems

Students should do and study all the problems within the chapters. Additional practice can be obtained by doing problems at the end of the chapter. Many answers are listed in the rear of the text, and all problems and activities with molecular models are answered and explained in the "Study Guide to Morrison and Boyd, Organic Chemistry." Students are also welcome to ask questions on all material during office hours and in class whenever time permits. Six hours per week of AMP workshops are also available for help.

Assessment

Student success in meeting the learning outcomes will be determined by a total of five exams given on the dates shown on the course schedule. The eligible material for each exam will be limited to topics covered during that section, and will be taken from information in the lectures, handouts, text, and the assigned exercises and problems. Portions of the exam may be given as homework. The final exam is mandatory; its score cannot be replaced. The final can also replace the score on a previous exam if that is lower. There will be no other makeup provisions. The exam grades will be averaged to obtain the average score for each student. The course grade will be determined from a scale based on the distribution of the average scores.

Academic Integrity and Plagiarism

Please refer to page 15 and 16 of the 2009-2011 University Catalog for a description of the CSUDH policy on academic integrity, and for the disciplinary options available in the event of violations. Students are expected to abide by the highest standards of academic integrity as expressed in this code.

CHE 312 Tentative Course Schedule
Spring 2011

Date	Topic	Chapter
Jan. 24, 26	Aromaticity—Benzene	14
Jan. 28, 31: Feb. 2, 4, 7, 9, 11, 14, 16, 18	Spectroscopy and Structure	17
Monday, Feb. 21	Presidents' Day Holiday	
Wednesday, Feb. 23	Exam I	14, 17
Feb. 25, 28; Mar. 2	Electrophilic Aromatic Substitution	15
Mar. 4, 7, 9	Aromatic-Aliphatic Compounds	16
Mar. 11, 14, 16, 18	Aldehydes and Ketones—Nucleophilic Addition	18
Monday, Mar. 21	Exam II	15, 16, 18
Mar. 23, 25	Carboxylic Acids	19
Mar. 28 to Apr. 1	Spring Recess	review
Apr. 4	Carboxylic Acids	19
Apr. 6, 8, 11, 13	Carboxylic Acid Derivatives—Nucleophilic Acyl Substitution	20
Apr. 15, 18, 20	CarbanionsI	21
Thursday, Apr. 21	Last day to withdraw from class; serious reason required.	
Friday, Apr. 22	Exam III	19, 20, 21
Apr. 25, 27, 29	Amines I, Preparation and Physical Properties	22
Apr. 29; May 2, 4, 6	Amines II, Reactions	23
May 9, 11, 13	Phenols	24
Monday, May 16, 10:00 a.m. to noon	Final exam	22, 23, 24