

California State University, Dominguez Hills
Department of Chemistry

SURVEY OF ORGANIC CHEMISTRY
General Information—Spring 2011

Course

CHE 316-01, 3 units

Meeting:

MWF 8:30-9:45 am; NSM D-129

Materials:

- Text: *Organic Chemistry: A Brief Survey of Concepts and Applications*, 6th edition, by P.S. Bailey, Jr., and C.A. Bailey
- Solutions Manual and Study Guide—to text
- Prepared lecture notes with outlines
- Binder—for storing notes, handouts, and problems
- Molecular Model Kit—required

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

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Policy

Objectives & Regulations

This course is a one-semester survey of organic chemistry for non-majors who are in fields in which chemistry is a core course. One year of general chemistry is the prerequisite. Simultaneous enrollment in the Survey of Organic Chemistry Laboratory, CHE 317, 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. Both aliphatic and aromatic compounds are covered, with functions that contain carbon combined with hydrogen, carbon, halogens, oxygen, and nitrogen. Topics include molecular structure, nomenclature, physical properties, isomerism, reactions, mechanisms, and stereochemistry. The selection and organization of the material is consistent with the short course focus and with the fields of study serviced by this course. Relationships and applications of organic chemistry to the life sciences, health and medicine, agriculture, consumer goods, energy and the environment are given. Awareness is fostered of ethical, social, and practical implications of these relationships and applications to the world. The magnificence of the detailed and exact structure of living things is revealed.

Teaching Methods

The interactive lectures will be presented on overhead transparencies and will follow the prepared outlines and detailed notes delineating the material in the text and emphasizing the important concepts. Class discussions will include tables and diagrams, demonstrations using molecular models, and solutions to textbook problems, often involving blackboard exercises engaging student participation. The Solutions Manual & Study Guide will assist the student to review and understand the concepts by providing chapter summaries, solutions to all textbook problems, and guidance for the activities with molecular models. The laboratory component of this course is offered as a separate unit with its own syllabus, schedule, and requirements.

Learning Outcomes

After completing this course the student should be able to

- 1) represent organic molecules using Lewis dot and valence bond diagrams, and condensed structural formulas.
- 2) diagram the formation of the various types of hybridized atomic orbitals involved in the bonding of organic compounds.
- 3) draw the organic molecules resulting from the overlap of atomic orbitals to form molecular orbitals.
- 4) distinguish between aliphatic and aromatic organic compounds.
- 5) recognize and draw the characteristic structures of the most fundamental classes of organic compounds.
- 6) distinguish between the several types of structural isomers and draw these for given molecular formulas.
- 7) distinguish between the several types of stereoisomers and draw them for given compounds.
- 8) name organic compounds, including any isomers.
- 9) arrange in order the acid/base strengths of organic compounds and of several relevant inorganic compounds.
- 10) use the valence bond and molecular orbital representation of organic molecules to explain resonance/conjugation.
- 11) write out and work with the reactions of the various functional-group families.
- 12) recognize and represent the fundamental types of organic reactions.
- 13) write out the mechanisms of several important reactions.
- 14) recognize the essential features of a valid reaction mechanism.
- 15) compare the mechanisms of electrophilic addition and of electrophilic aromatic substitution and explain the factors determining the different outcomes.
- 16) compare the mechanisms of nucleophilic substitution and of elimination and explain the factors controlling the competition between the two processes.

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 carefully the chapters listed on the schedule sheet **before class discussion** and review them together with the class notes afterwards. Students are responsible for all reading material, including the definitions of important terms in the margins, unless stated otherwise in class. To facilitate learning and retention, the student should consult frequently the Reaction Summary at the end of each relevant chapter, and the Summary of the IUPAC Nomenclature and the Glossary (of terms) in the Appendix. Reading of the Connections essays throughout the text will connect organic chemistry to our world.

Problems

Students should study all example problems and do all the practice problems within the chapters. Additional practice can be obtained by doing the referenced end-of-chapter problems. The correct answers are in the Study Guide. Students are also welcome to ask questions on all material during office hours and in class whenever time permits.

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. Parts of the exams may be given as take-home assignments. The final exam is mandatory; its score cannot be replaced. The lowest score earned on the other exams will be replaced by that of the final exam grade if this is higher. 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 pages 15 & 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 316 Tentative Course Schedule
Spring 2011**

Date	Topic	Chapter
Jan. 24	Preface & Student's Guide Introduction	pp. xii-xxii pp. 1-6
Jan. 26, 28, 31; Feb. 2	Chemical Bonding	1
Feb. 2, 4, 7, 9	Saturated Hydrocarbons	2
Feb. 9, 11	Unsaturated Hydrocarbons	3
Feb. 14, Monday	Exam I	1, 2, 3
Feb. 16, 18	Organic Reactions	4
Feb. 21	Holiday	
Feb. 23, 25, 28	Reactions of Unsaturated Compounds	5
Mar. 2, 4, 7, 9	Aromatic Compounds	6
Mar. 11, Friday	Exam II	4, 5, 6
Mar. 14, 16, 18	Stereochemistry	7
Mar. 21, 23, 25	Organic Halogen Compounds	8
Mar. 28 to Apr. 1	Spring Recess	Review
Apr. 4	Organic Halogen Compounds	8
Apr. 6, Wednesday	Exam III	7, 8
Apr. 8, 11, 13, 15, 18	Organic Hydroxy Compounds and Ethers	9
Apr. 18, 20, 22	Amines	10
Apr. 25 Monday	Exam IV	9, 10
Apr. 27, 29; May. 2, 4;	Carbonyl Compounds	11
May 4, 6	Carboxylic Acids	12
May 9, 11, 13	Carboxylic Acid Derivatives	13
May 18, Wednesday 8:30 - 10:30 a.m.	Final Exam	11, 12, 13