

THE COLLEGE AT
O L D W E S T B U R Y
STATE UNIVERSITY OF NEW YORK

CP3300: ORGANIC CHEMISTRY-I Lecture, Summer 2023

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Course Description: This is the first semester of a traditional two-semester course. The course involves systematic study of organic compounds, nomenclature, methods of preparation, physical and chemical properties, stereochemistry, and reaction mechanisms. In some cases, the organic chemistry is immediately applied to the appropriate class of biological molecules; topics such as carbohydrates, carboxylic acids and lipids, etc. will be discussed.

Teaching Objectives:

To introduce the student to the fundamental concepts of Organic Chemistry; and to present an underlying mechanistic rationale that unifies the discipline.

To present: Molecular orbital theory of covalent bonding; acids and bases including buffering of blood; alkanes, cycloalkanes and haloalkanes; stereochemistry; alkenes; alkynes; alcohols, ethers, and thiols; aromatics; substitution and elimination reactions; organometallic compounds; radicals.

To teach the student to apply the fundamental concepts to more complex organic systems.

After completing this course, students should be able to:

- Draw Lewis structures, resonance forms and Fischer projections of organic compounds.
- Predict relative acidities & basicities of organic compounds based on structure.
- Predict the hybridization and geometry of an atom in an organic molecule based on structure.
- Distinguish between covalent and non-covalent bonding in organic molecules. Predict weak intermolecular forces based on structure, and physical properties arising from there.
- Identify all types of isomers and functional groups found commonly in organic molecules and explain relative stabilities of conformational isomers.
- Use IUPAC rules of nomenclature to systematically name organic compounds.
- Explain ring strain in cycloalkanes. Draw *cis*- and *trans*- isomers of cycloalkanes, draw conformations of cyclohexane, and substituted cyclohexanes.
- Explain the mechanism of the free radical halogenation of alkanes, and be able to calculate relative abundance of each product.
- Understand SN1, SN2, E1 and E2 reactions mechanisms and be able to predict the products of competing SN1, SN2, E1 and E2 reactions.
- Classify structures as chiral or achiral, and identify mirror planes of symmetry. Assign (R) and (S) configurations.
- Identify enantiomers, diastereomers and meso compounds.
- Explain the synthesis, and predict the products of additions, oxidations, reductions and cleavage reactions of alkenes and alkynes.
- Analyze the structural features and synthesis of organic alcohols.

Lectures: Monday-Thursday 1:00 – 4:30 PM

Textbook: Organic Chemistry, 11th Edition, with MHConnect, by F.A. Carey, R.M. Giuliano, N.T. Allison and S.L. Bane. McGraw Hill. (Available as E-book, loose-leaf and hard copy.)
Student Solutions Manual for Organic Chemistry, 11th Edition, by N.T. Allison, F.A. Carey, R.M. Giuliano, S.L. Bane and R.C. Atkins.

Molecular models: You can buy any set you like. I have found this set particularly useful:
http://www.amazon.com/Prentice-Molecular-Model-Organic-Chemistry/dp/0205081363/ref=sr_1_1?ie=UTF8&qid=1438102210&sr=8-1&keywords=molecular+model+set+organic+chemistry

Attendance Policy: Attendance at all sessions is essential for proper understanding and mastery of the course material.

Podcasts: Some of the lectures will be podcasted before the class meets. For these lectures, the class time will be used for Q-A sessions and problem solving.

Make-up Policy: There will be no make-up exams or quizzes. A student who misses an exam should consult the instructor on the matter. The student should either contact the instructor before the exam (if there is a legitimate, extenuating reason available in advance) or no later than 48 hrs after the exam.

Quizzes: A total of 5 quizzes will be given via BrightSpace. These will contribute 10% towards your final grade. Each quiz will be about 10-15 min long. You may attempt each quiz twice.

Homework: Five Homework Assignments will be answered on BrightSpace. These Homework Assignments will count 5% of your final grade. You may attempt each HW 3 times.

Exams: Three exams based on class lectures will be given for a total value of 60% of your final grade. Each lecture exam contributes a maximum of 20% towards your final grade. There will also be a comprehensive final exam, which will contribute 25% towards your final grade. Exams may be multiple choices, long form, or a combination. Please see your tentative lecture schedule for dates. **There will be NO extra work of any kind to improve your grade.** If you would rather have an F instead of a D, D+, or C-, you must make the decision before you take the final exam and may decide not to take it. Once you take the final exam your grade will be reported as such whatever that happens to be, and cannot be changed just because it is lower than your expectation/need.

Office Hours: Mon & Wed immediately after class, all other times by appointment only.

Integrity: The highest ethical behavior is expected. This course recognizes and endorses the Student Code of Honor. As a faculty we share your commitment to creating an environment that fosters professionalism in our educational community.

Decorum: Please try to arrive 5 min before your scheduled time. Please have your cell phones on mute. If you are late, please come in quietly and try not to disturb the class.

Evaluation: Student performance will be evaluated as follows:

Home works	5%	Grades:					
Quizzes	10%	90 >	A	77-79	B-	60-64	D+
Exams 3	60%	87-89	A-	74-76	C+	55-59	D
Exam Final	25%	84-86	B+	70-73	C	< 54	F
		80-83	B	65-69	C-		

Tentative Lecture/Exam Schedule

Date	Chapter - Topic
Tue, May 30 th	Chapter 1: Remembering General Chemistry: Electronic structure & bonding
Wed, May 31 st & Thu, June 1 st	Chapter 1: Acids & Bases. Blood buffering Chapter 2: Structure and Molecular Properties, Alkanes/Cycloalkanes
Mon, June 5 th & Tue, June 6 th	Chapters 2/3: Conformations of Alkanes
Wed, June 7 th & Thu, June 8 th	Chapter 4: Molecular Chirality and Optical Activity
Mon, June 12 th	Chapter 5: Alcohols and Alkyl Halides
Tue, June 13 th & Wed, June 14 th	Chapters 5/6: Reactions of Alkenes; Nucleophilic Substitution
Thu, June 15 th	Chapters 6/ 7: Alkenes: Structure and Preparation
Mon, June 19 th & Tues, June 20 th	Chapters 7/8: Alkenes: Reactions
Wed, June 21 st & Thu, June 22 nd	Chapters 8/9: Alkynes
Mon, June 26 th	Chapters 9/10: Introduction to Free Radicals
Tue, June 27 th & Wed June 28 th	Chapter 10: Introduction to Free Radicals

Exams will be on the dates indicated below. Exams 1-3 will be 1.5-2 hours long and will be administered in the second half of the lecture period. Please do not ask, "can we have the exam first". Comprehensive Final Exam will be on the last day of the class, Thursday June 29th.

Exam 1: Chapters 1-3, Wednesday 7th June.

Exam 2: Chapters 4-6, Monday 19th June.

Exam 3: Chapters 7-9, Monday 26th June.

Final: Chapters 1-12 (Comprehensive), Thursday June 29th