

SYLLABUS

CHEM 223 – Organic Chemistry A – 1st Semester
Fall 2008 - LOYOLA UNIVERSITY CHICAGO (LUC)

Lecture:	#1139 Section 001	Tues+Thur	10:00 a.m. – 11:15 a.m.	Flanner – Auditorium 133
Discussion:	#1141 Section 002	Tues	1:00 p.m. – 2:00 p.m.	Damen 730
	#1142 Section 003	Thur	1:00 p.m. – 2:00 p.m.	Damen 730

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 Student Office Hours: Tues: 11:30-12:15, Wed and Fri: 11:30-1:00, + by prior appt

Required: Organic Chemistry, Wade, 6th ed., Prentice Hall, 2003 (ISBN 0-13-147871-0).

Suggested / Recommended Materials:

1. Study Guide and Solutions Manual, Wade & Simek, 6th ed. (ISBN 0-13-147882-6).
2. Molecular modeling kit, Darling, Prentice-Hall, Freeman (Maruzen), Proteus, or equivalent.
3. Spiral or bound notebook for homework problems.

Optional Materials:

4. Organic Chemistry as a Second Language, Klein (2nd edition, 2008), Wiley (ISBN 978-0-470-12929-6) *or*
Organic Chemistry as a Second Language, Klein (1st edition), Wiley (ISBN 0-471-27235-3).
5. Barron's Orgo Cards: Organic Chemistry Review, Wang, Razani, Lee, Wu, and Berkowitz (ISBN 0-7641-7503-3).
6. Organic Chemistry: A Short Course, Hart, Craine, Hart, and Hadad (12th edition, 2007), w/CD-ROM, Houghton Mifflin (ISBN-10: 0-618-59073-0, ISBN-13: 978-0-618-59073-5) (pls see instructor before purchasing, only for students who may require an alternative approach).

Grading (approx weight below) with grade guidelines: > 90% A; 75-90% B; 55-75% C; grading may be curved

EXAMS – 2 – dates scheduled and announced (subject to change, although unlikely) – NO MAKEUPS!	40%
QUIZZES – TBD – <u>unannounced</u> (during lecture or discussion or as take-home, no make-ups)	20%
HOMEWORK - assigned per topic, see Suggested Homework Assignment, below	5%
FINAL EXAM – date announced (and scheduled by CAS)	35%

- Unexcused absence merits a zero score.
- Excused absence is handled on a case-by-case basis; grade weighting may be adjusted, depending on the circumstance, but an excused absence **MUST BE CORROBORATED and DOCUMENTED**, e.g., accompanied by a note from the doctor, dentist, hospital rep, or funeral director, or by a court summons.

Course Objective: To guide, encourage, and foster the learning and understanding of Organic Chemistry – nomenclature, structures, properties, reactions, mechanisms, and syntheses – by the individual student, helping him/her to connect, extrapolate, integrate, and apply the many different aspects learned.

Student Outcomes: The successful student will learn how to ...

1. identify the various classes of organic compounds, their methods of preparation, and typical reactions.
2. name and draw specific organic compounds.
3. postulate a *logical* reaction mechanism for simple organic reactions.
4. discriminate amongst relative stabilities of reaction intermediates.
5. plan and write out multi-step syntheses using known functional group transformations.
6. prepare for basic purification/separation techniques of organic compounds required in the laboratory.
7. analyze and interpret data from various instruments used in separating and identifying organic compounds: IR, NMR, and UV-vis spectrophotometers and mass spectrograph.

Lecture and Discussion – Attendance and Attention: Important and required. Feel free to bring your books and modeling kit to class. Better yet, use them. Prepare for lecture by prior scanning of new material. Come prepared for discussion, ready to ask questions on assigned homework or yet unassimilated lecture material.

Phones and Pagers: Please be courteous and respectful of others. *Silent mode* during lecture and discussion. *Not allowed in sight or within hearing during exams, subject to confiscation.* NO phone conversations in lecture hall or in discussion class – before class, during class, after class – AT ANY TIME!

Academic Honesty: Essential, expected, and enforced. Dishonesty dictates consequences which may include: (1) notification of Chemistry Department Chair, student's Department Chair, and CAS Dean, (2) documentation in the student's official university record, and (3) dismissal from the university. Immediate consequences will include a **ZERO** on any item in question (quiz or exam). Please refer to the LUC Undergraduate Handbook on policies or the CAS website: http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf.

Study Strategies and Suggestions: One may approach the study of Organic Chemistry in a manner similar to tackling a new foreign language. Its study will provide a basis to understanding future material – building constantly, incessantly, and relentlessly on the structural and mechanistic information presented previously. Over 2 semesters, the course will cover functional groups, aliphatic and aromatic compounds, bonding, nomenclature, stereochemistry, conformational analysis, reaction mechanisms, multi-step syntheses, and spectroscopy. Because the course is cumulative and builds heavily on prior material, the best plan is to study Organic Chemistry regularly, every day, similar to practicing the piano. Collaboration on homework problems is encouraged, especially in a timely fashion. Experience dictates that positive outcomes (for exam and course grades) are directly proportional to working and understanding the assigned problems on a regular basis, i.e., applying the concepts learned to non-generic compounds.

Typically, Organic Chemistry is not efficiently self-taught. Overnight cramming will probably not produce success. The student should quickly read the chapter or segment to be covered BEFORE lecture to improve lecture comprehension. After lecture, careful detailed re-reading of the chapter or segment and focused working of the assigned problems are expected. *If anticipating a passing grade of C, the minimal time per week devoted to Organic Chemistry is estimated at 4 hr for lecture/discussion, 3-6 hr for reading, and 3-6 hr for homework.*

Suggested Homework Assignment:

- Chap 1: 1-11, 14-15, 17-18, 20, 23, 25, 27, 29, 32, 34-36, 39-40, 42, 44-45, 47
- Chap 2: 5, 7-11, 15-23, 35-36, 39-42, 44
- Chap 3: 1-5, 9-10, 14-17, 20-21, 27-30, 32-35, 37, 39, 44, 46
- Chap 4: 1-4, 7-13, 17-21, 24, 28-31, 32-33, 34-40, 42-43, 45-46, 50
- Chap 5: 1-3, 5-7, 16-22, 25-30
- Chap 6: 1-4, 6-7, 8-12, 14-16, 19-20, 22-24, 26, 29, 31-37, 44-45, 53, 56
- Chap 7: 1-2, 4-8, 13, 15, 19, 21, 23, 25, 34-35, 38, 40, 42-45
- Chap 8: 1-2, 4-19, 27a-b-c, 28, 32, 34-35, 36-37, 47, 49, 63-64
- Chap 9: 1-2, 5-8, 12-13, 18-19, 23-24, 33-34
- Chap 10: 3-4, 7-10, 13-20, 23-26, 28, 37-39, 49
- Chap 11: 2, 5-6, 9-11, 13, 22, 31, 34, 41-45
- Chap 12: 2-12, 14-19, 23, 25
- Chap 13: 2-36, 38-45
- Chap 14: TBD

Homework Package:

*** due Tuesday, November 25, 2008 by 2 p.m. ***

Hand in at least 10 completed problems (or parts of multiple-reaction problems) per chapter, Chapters 1–10. (Underlined problems are particularly insightful or anticipatory.) If not using a notebook, include name and date worked on **each** page, and mark the chapter and problem number for full credit. Staple package in order ***or*** turn in homework notebook (which will be returned to the student), flagging chapters, as applicable.

Lecture Outline (tentative, subject to change)

<u>Week</u>	<u>Date</u>	<u>Chapter</u>	<u>Topic</u>	<u>***EVENT***</u>
1	Aug 26 28	1-1 1-2 / 2-1	Intro: Lewis structures, bonding, resonance, acid-base, nomenclature ... Structure and properties	
2	Sept 1 M Sept 2 4	*** 2-2 3-1	***** Alkanes, cycloalkanes, bicyclics	***** LABOR DAY HOLIDAY *****
3	Sept 9 11	3-2 4-1	Chemical rxns - free radical halogenation, kinetics, intermediates ...	
4	Sept 16 Sept 18	4-2 5-1	Stereochemistry – chirality, isomers ...	
5	Sept 23 Sept 25	5-2 6-1	Alkyl halides, nucleophilic substitution and elimination	
6	Sept 30 Oct 2 Th	6-2 xxx	***** *****	***** EXAM I (Chapters 1-5) *****
7	Oct 7 Tu 9	*** 6-3	***** *****	***** MIDTERM BREAK *****
8	Oct 14 16	7-1 7-2	Alkenes	
9	Oct 21 23	8-1 8-2	Alkenes - rxns	
10	Oct 28 30 31 F	9-1 9-2 ***	Alkynes *****	***** (last day to withdraw with a W) *****
11	Nov 4 Tu 6	xxx 10-1	***** Alcohols	***** EXAM II (Chapters 6-9) *****
12	Nov 11 13	10-2 11-1	Alcohols – rxns	
13	Nov 18 20	11-2 12-1	Spectroscopy – IR and MS	
14	Nov 25 27 Th	12-2/13-1 ***	Spectroscopy – NMR *****	***** THANKSGIVING DAY – HOLIDAY *****
15	Dec 2 4	13-2 14-1	Ethers, epoxides, sulfides	
16	Dec 9 Tues	*****	***** Cumulative FINAL EXAM, 1:00 p.m. – 3:00 p.m., FH-133	