

SYLLABUS

CHEM 223 – Accelerated – Organic Chemistry A – 1st semester
 Summer 2014 - LOYOLA UNIVERSITY CHICAGO

Lecture/Discussion: #1532 Section: 001 **M+W+F: 8:30 a.m. – 11:10 a.m.** N.B. ***Flanner 007
 #1533 Section: 002 **M+W+F: 12:30 p.m. – 3:10 p.m.** N.B. ***Flanner 007

Lecturer: Dr. C. Szpunar
 Office: Flanner Hall **200B** Contact: best in person, 773-508-3128, cszpuna@luc.edu
 Message via Chemistry Dept. Office: 773-508-3100, fax: 773-508-3086
 Office Hours: directly after class
 N.B. answer keys will be posted in the glass case outside 200 B Flanner

Required:

1. Organic Chemistry, Wade 8th ed. (**red**), Prentice Hall, 2013 (ISBN 978-0-321-76841-4) *or* Wade, 7th ed. (**navy blue**), Prentice Hall, 2010 (ISBN 978-0-321-59231-6) *or* 6th ed. (**black**), Prentice Hall, 2003 (ISBN 0-13-147871-0) *or* 5th ed. (white)
2. Study Guide and Solutions Manual, Wade & Simek, 8th ed. (ISBN 978-0-321-77389-0) *or* 7th ed. (ISBN 978-0-321-59871-4) *or* 6th ed. (ISBN 0-13-147882-6) *or* 5th ed., appropriate to accompany text

Suggested / Recommended Materials:

1. Molecular modeling kit, Darling, Prentice-Hall, Freeman (Maruzen), Proteus, or equivalent
2. Spiral or bound notebook for homework problems

*****NO ACCESS CODE NEEDED, NOR DESIRED, NOR SUGGESTED**

Optional Materials (found helpful by some students, but hold off initially – do not purchase immediately):

1. Organic Chemistry as a Second Language, I, Klein (2nd edition, 2008), Wiley (ISBN 978-0-470-12929-6)
2. Barron's Orgo Cards: Organic Chemistry Review, Wang, Razani, Lee, Wu, and Berkowitz (ISBN 0-7641-7503-3) *or* Organic Chemistry Study Cards, R Van De Graaff, K Van De Graaff, and Prince, Morton Publishing, 2003 (ISBN 0-89582-577-5) *or* equivalent
3. 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 study approach.*)

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

MIDTERM EXAMS – 2 – dates scheduled and announced (subject to change, although unlikely)

!!! NO MAKE UPS !!! NO EARLY EXAMS !!!

40%

- UNEXCUSED ABSENCES merit a zero score.
- EXCUSED ABSENCES are handled on a case-by-case basis; grade weighting may be adjusted, depending on the circumstance(s); however, an excused absence **MUST BE CORROBORATED and DOCUMENTED**, e.g., accompanied by a note from the doctor, dentist, hospital rep, or funeral director; by a court summons, plane ticket stub, hospital release form, obituary, or other. With proper documentation, religious observance, representing the university, or personal emergency constitutes an Excused Absence.

QUIZZES – 3 – dates announced (subject to change, although unlikely) **!!! NO MAKE UPS !!!** **20%**

HOMEWORK - assigned per topic, see Suggested Homework Assignment, below. **5%**

FINAL EXAM **35%**

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. Please note that this course, *Organic Chemistry*, is cumulative, comprehensive, and improvement-based.

Student Outcomes: If successful, the 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.

Cell Phones: 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! NO texting – before class, during class, after class – AT ANY TIME! If you must talk or text, take it outside.

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 two semesters, the course will cover: bonding, functional groups, families of aliphatic and aromatic compounds, nomenclature, structures, stereochemistry, 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/segment to be covered BEFORE lecture to improve lecture comprehension. After lecture, careful detailed re-reading of the chapter/segment and focused working of the assigned problems are appropriate, necessary, and expected. In addition to student's participation in lecture, discussion, reading, and homework, joining and contributing to a study group is encouraged.

If anticipating a passing grade of C, the minimal time per week in the summer devoted to Organic Chemistry is estimated at 9 hr for lecture/discussion, 6-12 hr for reading, and 6-12 hr for homework.

Homework Package: *** due Wednesday, June 18, 2014 by 9 am / 1 pm, respectively ***

Hand in – directly to the lecturer, not to the departmental office – at least 15 completed problems (or parts of multiple problems) per chapter, **Chapters 1–10**. (Underlined problems are particularly insightful or anticipatory.) If not using a notebook, include your name and the date worked on **each** page. Mark the chapter and problem number for full credit. Staple package in chapter order ****and/or**** **flag chapters in packet / notebook** (which will be returned to the student), as applicable.

Suggested Homework Assignment (for Wade's 8th edition):

- Chap 1: 2-4, 6-10, 14-15, 17-18, 21, 23, 25, 27, 29, 31-32, 34-36, 39-40, 42-45, 52, 55
Chap 2: 3-5, 7-11, 15-22, 35-36, 39-42, 44 (note solutions manual p.40 – functionality)
Chap 3: 1-8, 10, 14-17, 20-21, 24-25, 29-30, 32-35, 37, 39, 44, 46
Chap 4: 1-2, 4, 7, 9-13, 18-21, 28-32, 35-39, 40, 42, 45-46
Chap 5: 1-7, 14-22, 25-31
Chap 6: 1-3, 5-7, 9-12, 14-20, 22-26, 27 (b-e), 29-45, 53, 56
Chap 7: 1-2, 4-8, 11-13, 15-16, 19, 21-25, 30-36, 38, 40-46
Chap 8: 1-2, 4-19, 21-22, 26-29, 32-37, 45-47, 49, 50, 63
(note solutions manual p.178 – addition + stereochemistry)
Chap 9: 1-2, 5-13, 18-20, 23-30, 32-37
Chap 10: 1-4, 7-10, 13-21, 23-26, 30-33, 37-41, 43, 49, 51
Chap 11: 1-2, 4-6, 9-13, 21-22, 26, 28-31, 37, 39-44, 46
Chap 12: 2-7, 11-12, 14-16, (17-fragmnt), 24-25
Chap 13: 2-11, 13-15, 22-25, 27, 32-36, 38-40, 42-44, 47-48
Chap 14: 4, 6, 8-10, 12, 14-15, (18 - mustard gas, bleach), 20, 22, 25, 27-33, (34), 39

(for Wade's 7th edition):

- Chap 1: 2-4, 6-10, 14-15, 17-18, 20-21, 23, 25, 27, 29, 31-32, 34-36, 39-40, 42-45, 54
Chap 2: 3-5, 7-11, 15-23, 35-36, 39-42, 44 (note solutions manual p.38 – functionality)
Chap 3: 1-5, 9-10, 14-17, 20-21, 24-25, 29-30, 32-35, 37, 39, 44, 46
Chap 4: 1-2, 4, 7-13, 18-22, 26, 28-31, 34-39, 42, 45-46, 50
Chap 5: 1-7, 15-22, 25-31
Chap 6: 1-3, 5-7, 9-12, 14-16, 19-20, 22-24, 30-38, 40-45, 53, 56
Chap 7: 1-2, 4-8, 11, 13, 15, 19, 21, 23-25, 30-36, 38, 40-46
Chap 8: 1-2, 4-15, 17-19, 21-22, 27-29, 32, 34-37, 46-47, 49, 63-64
(note solutions manual p.168 – addition + stereochemistry)
Chap 9: 1-2, 5-8, 12, 18-19, 23-29, 33-34, 36-37
Chap 10: 1-4, 7-10, 13-20, 23-26, 30-33, 37-39, 49, 51
Chap 11: 1-2, 5-6, 9-13, 21-22, 26, 31, 34, 39-45
Chap 12: 2-7, 11-12, 14-16, (17-fragmnt), 24-25
Chap 13: 2-11, 14-15, 22-25, 32-36, 38-44
Chap 14: TBD by student

(for Wade 6th edition):

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

Lecture Outline (tentative, subject to change, but unlikely due to time constraints)

<u>Lecture</u>	<u>Date</u>	<u>Chapter(s)</u>	<u>Topic</u>	<u>*** EVENT ***</u>
1	May 19	1	Intro: Lewis structures, bonding, resonance, acid-base, nomenclature	
2	May 21	2	Structure and properties	
3	May 23	3	Alkanes, cycloalkanes, bicyclics	
*****				QUIZ 1 (Chapters 1-2)
--	May 26	***** Memorial Day Holiday – NO CLASS *****		
4	May 28	4	Chemical rxns - free radical halogenation, kinetics, intermediates	
5	May 30	5	Stereochemistry – chirality, isomers ...	
*****				EXAM I (Chapters 1-4)
6	June 2	6	Alkyl halides, nucleophilic substitution and elimination	
7	June 4	6 / 7	Alkyl halides (continued) / Alkenes	
8	June 6	7	Alkenes (continued)	
*****				QUIZ 2 (Chapters 5-6)
9	June 9	8	Alkenes – rxns	
10	June 11	9	Alkynes	
11	June 13	10	Alcohols	
*****				EXAM II (Chapters 5-9)
12	June 16	10/11	Alcohols (continued) / Alcohols - rxns	
13	June 18	11	Alcohols – rxns (continued) ***HW package due***	
14	June 20	14	Ethers, epoxides, sulfides	
*****				QUIZ 3 (Chapters 10-11)
***** last day to withdraw with W, not WF *****				
15	June 23	12	Spectroscopy – IR and MS	
16	June 25	13	Spectroscopy – NMR	
17	June 27	12/13	Spectroscopy (continued)	
*****				Cumulative FINAL EXAM (focus: Chapters 10-14)

Daily Schedule - Mornings (tentative, approximate, flexible, subject to adjustment):

<u>Regular Day</u>	<u>Quiz Day</u>	<u>Exam Day</u>
08:30 – 09:00 am Q/A, admin	08:30 – 09:00 am Q/A	08:30 – 09:00 am Q/A
09:00 – 10:00 lecture – 1	09:00 – 10:00 lecture - 1	09:00 – 10:10 lecture
10:00 – 10:10 ***break***	10:00 – 10:10 ***break***	10:10 – 10:20 ***break***
10:10 – 10:30 discussion as time/topic permit	10:10 – 10:50 lecture – 2	10:20 – 11:10 EXAM
10:30 – 11:10 lecture - 2	10:50 – 11:10 <i>quiz</i>	*****
		08:30 – 09:00 Q/A
		09:00 – 09:10 ***break***
		09:10 – 11:10 FINAL

Daily Schedule – Afternoons (tentative, approximate, flexible, subject to adjustment):

<u>Regular Day</u>	<u>Quiz Day</u>	<u>Exam Day</u>
12:30 – 01:00 pm Q/A, admin	12:30 – 01:00 pm Q/A	12:30 – 01:00 pm Q/A
01:00 – 02:00 lecture – 1	01:00 – 02:00 lecture - 1	01:00 – 02:10 lecture
02:00 – 02:10 ***break***	02:00 – 02:10 ***break***	02:10 – 02:20 ***break***
02:10 – 02:30 discussion as time/topic permit	02:10 – 02:50 lecture – 2	02:20 – 03:10 EXAM
02:30 – 03:10 lecture - 2	02:50 – 03:10 <i>quiz</i>	*****
		12:30 – 01:00 Q/A
		01:00 – 01:10 ***break***
		01:10 – 03:10 FINAL