

SYLLABUS – CHEM 224 – Organic Chemistry B – 2nd Semester – TuThur am Lecture

Spring 2018 - LOYOLA UNIVERSITY CHICAGO (LUC)

Lecture: #1097	Section: 001	Tu + Thur	8:30 – 9:45 a.m.	Flanner Audit
Discussion: #1098	Section: 002	Monday	12:35 am – 01:25 pm	Flanner 007
#1099	Section: 003	Monday	01:40 pm – 02:30 pm	Flanner 007
#1101	Section: 004	Monday	02:45 pm – 03:35 pm	Flanner 007

Lecturer: Dr. C. Szpunar
 Office: Flanner Hall **200B** Contact: best in person, 773-508-3128, cszpuna@luc.edu
 Emergency Message via Chemistry Dept. Office: 773-508-3100, fax: 773-508-3086

Office Hours: **Tues:** 10 am – 12 noon, **Wed:** 11:30 am – 1:00 pm, **Thurs:** 10 – 11:15 am, and as arranged

Required:

1. Organic Chemistry, Klein, 3rd ed., Wiley, 2017
2. Student Study Guide and Solutions Manual, Klein, 3rd ed. Wiley, 2017

Option 1: ISBN 978-1-119-38071-9

1. Soft, unbound, printed 3-hole punch text
2. Paperback solutions manual/study guide
3. Wiley Plus plus Orion – the online homework/practice tool

Option 2: ISBN 978-1-119-43349-1

1. Soft, unbound, printed 3-hole punch text
2. Etext solutions manual/study guide
3. Wiley Plus plus Orion – the online homework/practice tool

Suggested / Recommended Materials:

1. Molecular modeling kit, Darling, Duluth, or equivalent
2. WileyPlus online homework/practice tool

Optional Materials (found helpful by some students, **do not purchase immediately**):

1. Organic Chemistry as a Second Language, II, Klein (2006), Wiley (ISBN 978-0-471-73808-4)
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

Grading (weighting below) with approximate curved grade guidelines: > 90% A; 75-90% B; 55-75% C

♪ **EXAMS – 2** – dates announced (subject to change, although unlikely) – **NO MAKE UPS** **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** – TBD – **UNANNOUNCED** (during lecture, discussion period, as take-home) **20%**

♪ **FINAL** – date announced (scheduled by CAS), **no alternative date/time, NO MAKE UPS** **40%**

♪♪ **Homework** - per chapter/topic; feel free to work any/all problems to apply and master concepts.

♪♪ **Optional Short Report** (as detailed below, one option ONLY) *** **BONUS** (maximum of 3 - 5%)

*** Please note that because this course, *Organic Chemistry*, is cumulative, comprehensive, and improvement-based, and because the final exam is deemed a culminating measure of a student's progress, any student meriting an F on the final exam may achieve a recorded course grade no higher than D, despite total points; a final-exam score of D may merit a course grade no higher than C, despite total points; and a final-exam score of C may merit a course grade no higher than B, despite student's standing otherwise (i.e., despite total points.)

*** Please note that once an overall course grade has been posted officially on LOCUS, any subsequent requests for an INCOMPLETE or any additional extra course credit with NOT be considered.

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

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 reagents / conditions to transform functional groups.
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; be ready to ask questions on assigned homework or yet-unassimilated lecture material.

Cell Phones: NONE. 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!!!

Photography: NONE. No photography of posted quiz or exam keys. No photography of discussion or lecture blackboard or whiteboard content.

Recording: NONE. No recording of lectures.

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/academics/catalog/undergrad/reg_academicintegrity.shtml.

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 and, hopefully, acquired by the student. 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 spectroscopic techniques. 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 situations.

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, essential, and expected. In addition to student's participation in lecture, discussion, reading, and homework, joining and contributing to a study group is strongly encouraged.

If anticipating a passing grade of C, the minimal time per week devoted to Organic Chemistry is estimated at 4 hr for lecture and discussion, 4-10 hr for reading, and 4-10 hr for homework.

Chemistry and Biochemistry Department CAUTION (effective Aug. 4, 2016):

A student who opts to withdraw from CHEM 224 lecture after midterm may be permitted to remain in CHEM 226 – the co-requisite laboratory, **ONLY** if his/her midterm grade, as posted in LOCUS, is a D or better. If a student plans to continue with the laboratory portion of the sequence, that student must continue to attend all of the lectures until the week of the official drop date, to gain as much background knowledge as possible in preparation for each laboratory assignment and in order to work safely in the laboratory amongst the other students. If a student is considering withdrawing from lecture, but remaining in the lab, the student may seek assistance from the Department of Chemistry and Biochemistry Office in the week prior to the deadline for withdrawing, beginning Monday at 9:00 am through Friday at 4:00 pm. **However, students with a midterm grade of F are required to drop the co-required laboratory along with the lecture without exception.**

Chemistry and Biochemistry Department Course Repeat Rule (effective Aug. 24, 2017):

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website: <http://www.luc.edu/chemistry/forms/> and obtain a signature from the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

Optional BONUS Report

CHEM 224, Spring 2018, Dr. Szpunar

*****BE SURE to include on the cover sheet OR on the top right of p1:**

- a) your name
- b) the date
- c) CHEM 224 – TuThur – Sec 001
- d) lecturer's name

Option 1 (max of 3%):

Visit the *International Museum of Surgical Science* and write a 3 pp. report (of 12-pt type, 1-in margins, double-spaced, and stapled) highlighting at least 2 of its exhibits. Neatly, attach a pamphlet from the museum or on one of its exhibits or proof of admission.

You may wish to check to see if the # 151 Sheridan Bus (or equivalent) is more efficient than the CTA el; the bus may drop you closer to the museum, located just south of North Avenue Beach near the Polish Consulate (red-and-white flag, Polish eagle) on inner Lake Shore Drive.

1524 N. Lake Shore Drive
Chicago, IL 60610 USA
312.642.6502, fax 312.642.9516, info@imss.org
HOURS: May - September: Tuesday through Sunday 10 am – 4 pm
October - April: Tuesday through Saturday 10 am – 4 pm
ADMISSION: Adults \$6, Students & Seniors \$3
(Be sure to check the website for updates on the time, current fee, and free day!)

Option 2 (max 5%):

Choose a **drug or health care product** with **organic functionalities**, such as those featured in the following articles or in any similar publication:

- *Chemical & Engineering News (C&E News)*, June 20, 2005, whole issue – “Top Pharmaceuticals, from aspirin to Viagra and more,” approx. 50 pharmaceuticals.
- *C&E News*, Sept. 25, 2006, cover story – “Addiction ... smoking, drug, and alcohol abuse,” pp. 21-44.
- *C&E News*, Oct. 30, 2006, cover story – “Biotechs ...,” pp. 14-20.
- *C&E News*, Nov. 13, 2006, cover story – “RNA ...,” pp. 16-23.
- *C&E News*, Oct. 2, 2006, cover story – “Mass Spectrometry ... proteins ...,” pp. 17-25.
- *C&E News*, Oct. 23, 2006, cover story – “Bacterial Banter ...,” pp. 17-26.
- *C&E News*, Dec. 4, 2006, cover story – “Pharm Year in Review,” pp. 17-28.

Write a 4-6 pp. report (of 12-pt type, 1-in margins, double-spaced, and stapled, with at least 3 pertinent references or citations at the end of the report). Include the following:

- Explain why the drug or health care product is of importance or interest to you.
- **Identify all the functional groups from an organic perspective.**
- **Propose how you might verify the various functionalities spectroscopically**, esp. via IR and NMR. Mention other methods, as applicable, i.e., via UV and MS.
- Suggest hypothetically how you might change the molecule synthetically, at one functional site minimally, and state what you hope to achieve efficaciously by doing so.

***** due on/before Friday, April 6, 2018 – but NOT LATER than noon *****

- handed directly to the Sr. Lecturer, before or after class
- or delivered to her office, Flanner 200B
- NOT to be delivered to the Chemistry and Biochemistry Dept Office

N.B.: This optional BONUS Report, either option but one option only, is intended for enrichment; points therefrom are ONLY considered as a grade component IF the student's interim or final grade is a C or better (i.e., >55% approx weighting).

Lecture Outline for *Klein Ed. 3* (tentative, subject to change) – Spring 2018

<u>Week</u>	<u>Date</u>	<u>Ch-Lect</u>	<u>Topic</u>	***EVENT***
1	Jan 15 Jan 16 Jan 18	*** 14-1 14-2	Review – IR Spectroscopy and MS	***** Monday ***** MartinLutherKing Day HOLIDAY
2	Jan 23 Jan 25	15-1 15-2	NMR Spectroscopy	
3	Jan 30 Feb 1	16-1 16-2	Conjugated Systems	
4	Feb 6 Feb 8	17-1 17-2	Aromatic Compounds	
5	Feb 13 Feb 15	18-1 18-2	Aromatic Reactions	
6	Feb 20 Feb 22	18-3 ***		***** Thursday ***** EXAM I (Chapters 14-18)
7	Feb 27 Mar 1	19-1 19-2	Aldehydes and Ketones	
8	Mar 5-10	***		***** Monday-Saturday ***** MIDTERM Spring BREAK
9	Mar 13 Mar 15	19-3 20-1	Carboxylic Acid and Derivatives	
10	Mar 20 Mar 22	20-2 21-1	Alpha Carbon Enols and Enolates	
11	Mar 26 Mar 27 Mar 29	*** 21-2 ***		***** Monday ***** (last day to withdraw with a W) ***** ***** Thursday ***** EXAM II (Chapters 18-21)
	Mar 30 – Apr 2	***		***** Good Friday - Easter Monday ***** EASTER BREAK
12	Apr 3 Apr 5 Apr 6	21-3 22-1 ***	Amines	*** optional BONUS report due by noon ***
13	Apr 10 Apr 12	22-2 23-1	Amines Organometallics	
14	Apr 17 Apr 19	24-1 24-2	Carbohydrates	
15	Apr 24 Apr 26	25-1 26-1	Amino Acids, Peptides, and Proteins Lipids	
16	May 5 Sat		Cumulative FINAL EXAM, 9:00 – 11:00 am, Flanner Auditorium	