

SYLLABUS – CHEM 224 – Organic Chemistry B – 2nd Semester
Spring 2022 - LOYOLA UNIVERSITY CHICAGO (LUC)

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|-----------------------|---------------------|---------------|-----------------------|------------------|
| Lecture: #1109 | Section: 004 | TuThur | 8:30 – 9:45 am | Cuneo 210 |
| Disc: #1110 | Section: 005 | Mon | 11:30 am – 12:20 pm | Flanner 007 |
| #1111 | Section: 006 | Mon | 12:35 pm – 1:25 pm | Flanner 007 |

*** Please note that this course is scheduled to be taught and administered ON-CAMPUS, not online, subject to changes mandated for public safety by the State of Illinois, the City of Chicago, and/or Loyola University Chicago.

Sr. Lecturer: Prof. C. Szpunar cszpuna@luc.edu Office: Flanner Hall **200B**
 Student Office Hours: *typically available:* Tues and Thur: 10:30 am – 1:00 pm, Fri: 11:45 am – 1 pm
 Emergency Message, as warranted, via Chemistry Dept. Office: 773-508-3100

Required: (See bookstore for most up-to-date offerings, as publisher rep interacts directly with bookstore.)

1. Organic Chemistry, Klein, 3rd ed., Wiley, 2017, changing to 4th ed., Wiley 2021 – either edition acceptable, any format acceptable: softbound, unbound – printed, 3-hole punched, or electronic
2. Student Study Guide and Solutions Manual, Klein, 3rd ed. Wiley, 2017, changing to 4th ed., Wiley 2021

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

1. Soft, unbound, printed 3-hole punch text
2. Paperback solutions manual/study guide
3. WileyPlus – an online homework/practice tool

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

1. Soft, unbound, printed 3-hole punch text
2. Etext solutions manual/study guide
3. WileyPlus – an online homework/practice tool

Suggested:

Molecular modeling kit, Darling, Duluth, or equivalent

Recommended:

WileyPlus online homework/practice tool:

Course ID: TBA

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

1. Organic Chemistry as a Second Language, 5th ed., **Second-Semester Topics**, Klein (Oct 2019), Wiley (ISBN 978-1-119-49391-4, 1-119-49391-9) *or* equivalent previous editions.
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* any type of flash cards, including self-made

Grading Guidelines (approx. weighting below):

>91% A, 91-90% a-, 90-88.5% b+, **88.5-75% B**, 75-70% b-, 70-68.5% c+, **68.5-55% C**, 55-50% c-, **50-45% D**, **<45% F**

♪ **EXAMS – 3** – dates announced, may be curved, **NO MAKE UPS** **50%**

- 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, when representing the university, or if a personal emergency constitutes an Excused Absence.

♪♪ **QUIZZES** – dates announced, **NO MAKE UPS** **20%**

♪♪♪ **FINAL** – date announced, as scheduled by CAS, **no alternate date/time**, **NO MAKE UPS** **30%**

♪♪♪♪ **Homework** - per chapter, per topic; student may feel free to work any, all, and as many problems to apply and master concepts – **recommended for student success.**

*** Please note that this course, Organic Chemistry, is **cumulative, comprehensive, and improvement-based**. The final-exam grade – deemed a culminating measure of a student's progress – and the student's LUC-Early-Alert status grade may be taken into account, subjectively, in assigning the student's overall course grade.

*** Also please note that once an overall course grade has been posted officially on LOCUS, any subsequent requests for an INCOMPLETE GRADE or for any additional extra credit WILL NOT and CANNOT 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, using critical thinking.

Student Outcomes: If successful, the student will learn how to ...

1. identify the various classes / families of organic compounds, their properties, their methods of preparation, and some typical reactions / transformations.
2. name and draw specific organic compounds.
3. postulate logical / acceptable reaction mechanisms for simple organic reactions.
4. discriminate amongst relative stabilities of reaction intermediates.
5. plan and write out effective, efficient multi-step syntheses using known reagents / conditions to transform functional groups and to add or remove carbons.
6. prepare for typical purification / separation techniques of organic compounds required in the laboratory.
7. analyze and interpret data from a combination of spectroscopic / analytical techniques used in separating and identifying organic compounds: IR, NMR, and UV-vis, and mass spectrometry.

*****Lectures – Attention and Participation: Important and essential. N.B.!!! (Note well!!)**

- Feel free to use your models at any time, even during a test or quiz. Many of us need to see a 3-dimensional (3D) representation.
- Prepare for lectures by scanning the Klein-text headers and illustrations for the new material to be presented.
- Feel free to print out the Power-Point lecture highlights (via Sakai – Resources) before each lecture, to use for notetaking in lecture, to be ready to listen in lecture, to better acquire new concepts to be learned / applied.
- After lecture, read the corresponding text for enrichment. However, please note that **whatever is covered in lecture rules!** Use the text as a resource. We make adjustments, we fine-tune in lecture and in discussion.
- Subsequently, do HW problems to assimilate the concepts, as many as needed to acquire the concepts – the key to success! Use the Klein study guide to help explain the HW-problem responses. Note that the study-guide answers may not be all encompassing, nor unique, nor complete.
- Feel free to ask questions during discussion on homework problems or as yet-unassimilated lecture material, anything chemistry. Come prepared to do so!
- Explanations to HW problems or lecture concepts deemed particularly significant will be shared with all students, as appropriate, to the extent possible.

Academic Honesty: Essential, expected, and enforced. All student submissions – assignments, quizzes and exams – are subject to the Honor System. Upon student notification, any breach in academic integrity, any dishonesty, dictates consequences which may include:

- (1) notification of Chemistry and Biochemistry Department Chair,
- (2) notification of the CAS Assistant Dean for Student Academic Affairs, and
- (3) notation in the student's official university record upon documentation.

Immediate consequences will include a ZERO score on any item in question, i.e., the quiz or the exam.

Please refer to the LUC CAS Academic Integrity Statement and the sanctions for academic misconduct:

<http://www.luc.edu/cas/advising/academicintegritystatement> .

Some students may not be aware of copyright and intellectual property rights. Therefore, as per the Aug. 6, 2021 CAS policy-and-procedures directives, students are herein reminded: "that materials from the course cannot be shared outside the course without the instructor's *written permission*. Also, as noted in various University communications ... privacy ... about recording of ... class sessions" is mandated.

Study Strategies and Suggestions: Students should approach the study of Organic Chemistry in a manner similar to tackling a new foreign language. Persistent, continuing 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, this course will cover: bonding, functional groups, properties of aliphatic and aromatic compounds, nomenclature, structures, stereochemistry, reaction mechanisms, syntheses, multi-step syntheses, and spectroscopic techniques. Because this course is cumulative and builds heavily on prior material, the best plan is to study Organic Chemistry regularly, every day, similarly to practicing the piano, similarly to learning a language. “Organic Chemistry has its own language – Organese,” according to Szpunar.

For study purposes, small student-formed study groups and **collaboration with others on HW problems is strongly encouraged**, especially in a timely fashion BEFORE an exam or quiz, to better understand and integrate the new material and in preparation for any assessment. “What one person sees, another person may see differently.” Different perspectives, approaching and tackling a problem in different ways, from various angles, are often quite helpful to all involved in this sanctioned collaboration.

Experience has illustrated that positive outcomes (for exam and course grades) – the secret to any student’s success – are directly proportional to working and understanding the relevant problems on a regular basis, *i.e.*, applying the concepts learned to specific, non-generic situations and thinking creatively. Typically, normally, usually, Organic Chemistry is not efficiently self-taught!!!

Experience has demonstrated that overnight cramming will probably NOT produce success! The student should scan the text chapter / segment expected to be covered BEFORE each lecture to improve lecture comprehension. After each lecture, careful detailed reading of the chapter/segment/topic and focused working of the homework problems are appropriate, necessary, essential, and expected.

Attending lecture, participating in discussion, reading the text, infusing self-comprehension with practice through homework problems, and joining and contributing to a study group are strongly encouraged.

In anticipation of an acceptable / 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 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 contact the Chemistry Department, request permission to register 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. Approval is also required from the student’s Academic Advisor to secure final permission for the attempt.

Accommodations (SSWD/SAC):

Typically, normally, usually, any student requesting accommodation(s) for extra exam time, different test venue, special equipment, and/or other course considerations would present his/her required SSWD/SSA letter in the first or second week of the term, but NOT less than 10 days before a scheduled exam.

Please note that when requesting extra exam time, the student MUST NOT have scheduled another class directly BEFORE and directly AFTER this course, which would preclude him/her from taking the scheduled exam AT THE TIME OF THE GIVEN EXAM, *i.e.*, the SSWD/SSA exam time **must overlap** the official exam time to be fair to ALL students. The student should note the posted SSWD/SSA office schedule for his/her requests; he/she must schedule each accommodated exam at least one week prior to any exam, where any such accommodation might be requested.

Lecture Outline for Klein Text Reference (tentative)

| <u>Week</u> | <u>Date</u> | <u>Chapter</u> | <u>Lecture Topic / Assignment / Activity</u> |
|-------------|--------------------------------------|----------------|---|
| 1 | Jan 17 Jan 18+20 Jan 20 | 14 | *** no discussion *** **** Holiday – Martin Luther King Day **** Review – IR Spectroscopy and MS ***Thur - Mon*** TH 1st Semester Synthesis Review |
| 2 | Jan 24 Jan 25+27 Jan 27 | 15 | Monday discussion – <i>Synthesis Review due at beginning of discussion</i> NMR Spectroscopy ***Thur - Mon*** TH Spec Pkg (Chapters 14-15) |
| 3 | Jan 31 Feb 1+3 | 16 | Monday discussion – <i>Spectroscopy Package due at beginning of discussion</i> Conjugated Systems - Dienes |
| 4 | Feb 7 Feb 8+10 | 17 | Monday discussion Aromatic Compounds |
| 5 | Feb 14 Feb 15 Feb 17 | 18 | Monday discussion ***** Tues ***** EXAM I (Chapters 14-17) Aromatic Reactions |
| 6 | Feb 21 Feb 22+24 | | Monday discussion |
| 7 | Feb 28 Mar 1+3 | 19 | Monday discussion *** Quiz 3 (Chapters 17-18) Aldehydes and Ketones |
| 8 | Mar 7 to Mar 11 | | <i>Spring Break Week (post Covid)</i> **** MIDTERM BREAK **** |
| 9 | Mar 14 Mar 15+17 | 20 | Monday discussion Carboxylic Acids and Derivatives |
| 10 | Mar 21 Mar 22 | | Monday discussion ***** Tues ***** EXAM II (Chapters 18-20) |
| | Mar 24 | 21 | Alpha Carbon Enols and Enolates |
| 11 | Mar 28 Mar 29 Mar 31 | 22 | Monday discussion *** last day to withdraw with a W Amines |
| 12 | Apr 4 Apr 5 Apr 7 | 23/24 | Monday discussion Quiz 4 (Chapters 21-22) Organometallics / Carbohydrates |
| 13 | Apr 11 Apr 12+14 | | Monday discussion |
| | Apr 15 to Apr 18 | | ***** Easter Break, Good Friday to Easter Monday ***** |

- 14 Apr 18 *** no discussion *** **** Holiday – Easter Monday ****
 Apr 19
 Apr 21 ***** **Thur** ***** **EXAM III (Chapters 21-24)**
- 15 Apr 25 Monday discussion
 Apr 26 25 Amino Acids, Peptides, and Proteins
 Apr 28 26 Lipids
- 16 **May 4** **Cumulative (two-semester) FINAL EXAM, CAS mandated for ALL Organic Chemistry sections, Wednesday evening, 8-10 pm, location TBD, AFTER STUDY DAY ENDS – check Sakai Overview for updates.**