

SYLLABUS – CHEM 223 – Organic Chemistry A – 1st Semester
 FALL 2021 - LOYOLA UNIVERSITY CHICAGO (LUC)

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|--------------------|-------|---------------------|--------------------|----------------------------|-----------------------------|
| Lecture: | #1056 | Section: 001 | Mon+Wed+Fri | 10:50 am – 11:40 am | Flanner – Auditorium |
| Discussion: | #1057 | Section: 002 | Mon | 12:10 pm – 1:00 pm | Flanner 007 |
| | #1058 | Section: 003 | Mon | 1:30 pm – 2:20 pm | Flanner 007 |
| | #2913 | Section: 004 | Mon | 2:50 pm – 3:40 pm | Flanner 007 |

***** Please note that upon returning to campus, this course is scheduled to be taught, participated, completed, and administered ON-CAMPUS, NOT ONLINE, NOT as a hybrid course, subject to any changes for public safety mandated by the City of Chicago and by Loyola University.**

Sr. Lecturer: Prof. C. Szpunar, cszpuna@luc.edu

Student Office Hours: *typically available, Tu 11:30 am – 1 pm, W 12 – 2 pm, Th 12:45 – 1:45 pm*

Office: Flanner Hall **200B**

Emergency Message via Chemistry Dept. Office: 773-508-3100, fax: 773-508-3086

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

- Organic Chemistry, Klein, 3rd ed text, Wiley, 2017 – **changing to 4th ed., Wiley 2021?**
 Versions – softbound, unbound - printed 3-hole punch text, or electronic
- Student Study Guide and Solutions Manual, Klein, 3rd ed. Wiley, 2017 – **changing to 4th ed., Wiley 2021?**

Suggested / Recommended Materials:

- Molecular modeling kit, Darling, Duluth, or equivalent
- WileyPlus online homework/practice tool, if/as available

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

- Organic Chemistry as a Second Language, First-Semester Topics, 5th ed. Semester I, Klein (Aug 2019), Wiley (ISBN 978-1-119-49348-8, 1-119-49438*X) *or* equivalent previous editions
- 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 – dates announced **NO MAKE UPS - EXAMS** **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, representing the university, or personal emergency constitutes an Excused Absence.

QUIZZES – dates announced **NO MAKE UPS - QUIZZES** **20%**

FINAL – scheduled by CAS **NO MAKE UPS** **30%**

***** Homework (HW)** - per chapter/section/topic; feel free to work any, all, and as many problems to apply/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 also 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, conventional, step-by-step mechanisms for simple organic reactions.
4. discriminate amongst relative stabilities of reaction intermediates.
5. plan and write out effective, efficient, high-yield, multi-step syntheses using known reagents/conditions to transform functional groups and to add or remove carbons.
6. prepare for purification / separation / synthetic laboratory techniques for organic compounds.
7. analyze and interpret data from a combination of spectroscopic / analytical techniques used in separating and identifying organic compounds: IR, NMR, UV-vis, and mass spectrometry.

*****Lectures – Attention/Participation: *Important and essential. N.B.!!!***

- Feel free to use your models at any time. 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.
- Feel free to print out the Power-Point lecture highlights (via Sakai – Resources) to use for notetaking in lecture to acquire new concepts to be learned and applied.
- 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; the study-guide answers may not be unique, nor complete.
- Feel free to ask questions during discussion on homework problems or as yet-unassimilated lecture material, anything chemistry.
- Explanations to homework problems or lecture concepts deemed particularly relevant or significant will be shared with all students, as appropriate.

Academic Honesty: Essential, expected, and enforced. Be advised!!!

Upon student notification, dishonesty dictates consequences which will 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 and investigation.

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> .

N.B.! Assignments/submissions for this course are subject to the **Honor System**. Do your own work! Googled and U-Tube responses are NOT acceptable. Lecture and discussion dictate acceptability for all responses to be graded.

As per the Aug. 6, 2021 CAS policy-and-procedures directives, students are hereby reminded: “that materials from the course cannot be shared outside the course without the instructor’s written permission. Students may not be aware of copyright and intellectual property rights. As noted in various University communications ... privacy ... about recording of online class sessions” is mandated.

Study Strategies, Suggestions, and Warnings: 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, already 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, 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.

However, **collaboration is NOT acceptable and NOT permitted on assessments, i.e., NOT DURING a quiz, nor an exam!!! Collaboration on any assessment demands consequences and accountability**, so that ALL students are treated fairly. Moreover, after a graded assignment has been returned, students are advised that unless an obvious grading error has occurred, point questioning (point scavenging) is frowned upon and adjusting partial credit on the grading key for any individual’s assignment (point fighting), AFTER an assessment, will most likely not occur.

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 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. **Please remember that collaboration is NOT permitted during an assessment, not for a quiz, not for an exam.** Such an activity is subject to Loyola’s Academic Integrity Policy. This policy has been, is, and will continue to be enforced!

If 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 LABORATORY Caution (effective Aug. 4, 2016, adj Aug. 27, 2019):

A student who opts to withdraw from CHEM 223 lecture after midterm may be permitted to remain in CHEM 225 – the accompanying laboratory. 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 laboratory, 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.

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 a student’s second attempt, the student must secure approval for a third attempt. Students must contact the Chemistry & Biochemistry 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. Approval is also required from the student’s Academic Advisor to secure final permission for the attempt.

Accommodations (SSWD/SAC):

Any student requesting accommodation(s) for extra exam time, different test venue, special equipment, and/or other course considerations should present his/her required SSWD/SSA letter to the Chair of the Chemistry and Biochemistry Department by the second week of the term, but NOT later 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 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 – Klein Text Reference – by Topic (to be adjusted for Klein 4th ed)

| <u>Week</u> | <u>Date</u> | <u>Ch-Lect</u> | <u>Topic</u> |
|-------------|---|----------------------------------|--|
| 1 | Aug 30 Sept 1 <u>Sept 3</u> | 1-1 1-2 1-3 | Review – Gen Chem: Electrons, Bonds, Molecular Properties |
| 2 | Sept 6 Sept 8 <u>Sept 10</u> | | *** MONDAY ***** LABOR DAY – HOLIDAY Molecular Representations |
| 3 | Sept 13 Sept 15 <u>Sept 17</u> | 2-3 disc 3-1 3-2 | *** MONDAY *** Quiz #1 Acids and Bases |
| 4 | Sept 20 <i>Sept 22</i> <u>Sept 24</u> | 3-3 disc 4-1 | *** Wednesday *** EXAM I (Chapters 1-3) Alkanes and Cycloalkanes |
| 5 | Sept 27 Sept 29 <u>Oct 1</u> | 4-2 disc 4-3 5-1 | Stereoisomerism |
| 6 | Oct 4 Oct 6 <u>Oct 8</u> | 5-2 disc 5-3 6-1 | *** MONDAY *** Quiz #2 Chemical Reactivity and Mechanisms |
| 7 | Oct 11-12 Oct 13 <u>Oct 15</u> | *** 6-2 6-3 | *** Monday/Tuesday ***** MIDTERM BREAK |
| 8 | Oct 18 <i>Oct 20</i> <u>Oct 22</u> | 7-1 disc *** 7-2 | Alkyl Halides: Nucleophilic Substitution and Elimination Reactions *** Wednesday *** EXAM II (Chapters 4-6) |
| 9 | Oct 25 Oct 27 <u>Oct 29</u> | 7-3 disc 7-4 8-1 | Addition Reactions of Alkenes |
| 10 | Nov 1 Nov 3 <u>Nov 5</u> | 8-2 disc 8-3 8-4 | ***** FRIDAY ***** (last day to withdraw with a W) |

- 11 Nov 8 9-1 Alkynes
 disc *** MONDAY *** Quiz #3
 Nov 10 9-2
 Nov 12 10-1 Radical Reactions
- 12 Nov 15 10-2
 disc
 Nov 17 11 Synthesis
 Nov 19 12-1 Alcohols and Phenols
- 13 Nov 22 *** *** **Monday** *** **EXAM III** (Chapters 7-11)
 Nov 24-26 *** *** WED-FRIDAY *** THANKSGIVING DAY – HOLIDAY ***
- 14 Nov 29 12-2
 disc
 Dec 1 12-3
 Dec 3 14-1 Spectroscopy – IR and MS
- 15 Dec 6 14-2
 disc
 Dec 8 14-3
 Dec 10 13 Ethers, Epoxides; Thiols and Sulfides (student to finish on his/her own, if time does not permit)
- 16 **Dec 16 Thurs Cumulative FINAL EXAM, 8:00 – 10:00 pm**
 all OC sections testing simultaneously, as mandated by CAS
 ON-CAMPUS Flanner Auditorium, 133, unless directed elsewhere