

**Organic Chemistry 224 - Summer 2022**

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Lecture Mon/Wed/Fri 1:10 – 4:00 p.m. CST Zoom

Office Hours Mon/Wed/Fri: 11:30 a.m. – 12:30 p.m. CST

*Required Text:* David Klein, "Organic Chemistry" 4<sup>th</sup> Ed. hard copy or e-text

*Required Key:* WileyPLUS for Organic Chemistry (login information can be found under the resources tab in Sakai)

*Recommended:* Your favorite molecular modeling kit. Here are some options. (\$ not guaranteed)

- Darling \$18.65 in LUC Bookstore with cardboard box; \$15 in stockroom
- Darling \$36.00 in LUC Bookstore with green plastic box
- Prentice Hall Molecular Model Set for Organic \$35.33 (colorful & pretty)
- Prentice-Hall Framework Molecular Models (Brumlik) \$45.80 (tubes to cut)
- HGS Fundamental Organic Set \$17.00

*Extra help:* *Pushing Electrons* by Daniel Weeks  
*The Organic Chemistry Answer* by Matthew J. Hamiel

Do you have an interest in human health, prescription medicines and drugs? Organic chemistry is utilized by medicinal organic chemists for the design and construction of new molecules that are prescribed by doctors and dispensed by pharmacists to treat diseases. Organic chemistry is also the essential science for inventing new soaps and detergents, dyes, plastics, and resins, and it is also used in creating certain types of new photoreceptors for renewable solar energy.

### 1. Course Content & Objectives:

Second semester of a two-semester sequence for non-chemistry majors. Mastery of the second semester material requires comprehensive understanding and recall of the first semester material. Organic chemistry of conjugated  $\pi$  systems, aromatics, carbonyl compounds, amines, carboxylic acids and their derivatives, carbohydrates, lipids and proteins. The student should 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 organic reactions.
4. discriminate among relative stabilities of reaction intermediates.
5. plan and write out multi-step syntheses using known functional group transformations, including syntheses of polyfunctional organic compounds.
6. name, draw and interpret the 2- and 3-dimensional structures of important biopolymers, and techniques for their synthesis and characterization.
7. analyze and interpret data from various instruments used in separating and identifying organic compounds including: IR, NMR, UV-vis and MS.

2. *IDEA Objectives:*

1. Gaining factual knowledge (terminology, classifications, methods, trends)
2. Learning fundamental principles, generalizations, or theories
3. Learning to *apply* course material (to improve thinking, problem solving, and decisions)
4. Learning how to find and use resources for answering questions or solving problems
5. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view
6. 5 extra credit points will be awarded to the entire class if there is a 95% class response to the end of the semester IDEA survey

3. *Quiz Dates (subject to change):*

Wednesday, July 13, 2022:	<b>Quiz 1</b>
Friday, July 22, 2022:	<b>Quiz 2</b>
Monday, August 1, 2022:	<b>Quiz 3</b>
Monday, August 8, 2022:	<b>Quiz 4</b>

4. *Exam Dates (subject to change):*

Friday, July 15, 2022:	<b>Mid-term Exam 1</b>
Wednesday, July 27, 2022:	<b>Mid-term Exam 2</b>
Friday, August 5, 2022:	<b>Mid-term Exam 3</b>
Friday, August 12, 2022:	<b>Final Exam, 1:30-3:30 p.m. CST</b>

5. *Quizzes, Exams, and Grading:*

A total of four group quizzes will be given during the day of your discussion section. You will be assigned a quiz group the first week of class. Each group will find the quiz posted in Gradescope at 12:00 p.m CST on the day of the assigned quiz. Each group must submit one answered, completed copy of the quiz back to Gradescope, signed by every member of the group, no later than 8:00 p.m CST that same night. Do not submit more than one copy of the quiz per group. You may not discuss or share the questions and answers with any other student in a different quiz group or class. Any violation of these policies will be in violation with the Academic Honesty policy described below. The lowest of your four quiz grades will be dropped. If you miss a quiz, that is the quiz that will be dropped. **No make-up quizzes will be given under any circumstances.**

There are three cumulative 50-minute mid-term exams and one cumulative (**THIS INCLUDES MATERIAL FROM 223**) 2-hour final exam. The three mid-term exams will be administered at the beginning of the class. Exams will be posted to Gradescope 10 minutes before the exam time. This time is to be used to print out a copy of the exam and get yourself into a quite and comfortable place. All exams will be proctored over Zoom. Students must take their exams on camera. The use of cell phones, tablets, or any electronic devices is prohibited. You may not discuss or share the questions and answers with any other student in any class. Any violation of these policies will be in violation with the Academic Honesty policy described below. After the 50 minutes, you will have an additional 10 minutes to scan your exam (I recommend using CamScan) and upload your exam back to Gradescope. Exams will be graded and returned to you via Gradescope as quickly as possible. All grading questions, points of clarification, and grading errors must be brought to the instructor's attentions during office hours no later than one week after return of the exam.

The lowest of the three mid-term exams will be dropped. If you miss an hourly exam, that is the exam that will be dropped. **No make-up mid-term exams will be given under any circumstances.** The final exam is cumulative and cannot be dropped.

WileyPLUS	10%	
Quizzes	15%	(Best three out of four quizzes)
Mid-term exams	40%	(Best two out of three mid-term exams)
<u>Final Exam</u>	<u>35%</u>	
TOTAL	100%	

The grading scale used to determine letter grades are as follows: **A** 100 – 93, **A-** 92 – 87, **B+** 86 – 83, **B** 82 – 78, **B-** 77 – 73, **C+** 72 – 68, **C** 67 – 61, **C-** 60 – 55, **D** 54 – 50, **F** < 50.

#### 6. Final Exam:

The University sets the schedule for all final exams. The final exam will be held on:

**Friday, August 12, 2022 1:30 – 3:30 p.m. CST**

You will have exactly 2 hours to complete the exam. Additional time will not be granted, even if you arrive late. There will be no make-up final exams given under any circumstances, and the exam will not be given early, either.

Instructors may not reschedule final exams for a class for another day and/or time during the final exam period. There can be no divergence from the posted schedule of dates for final exams. Individual students who have four (4) final exams scheduled for the same date may request to have one of those exams rescheduled. If a student reports having four (4) final examinations scheduled for the same date, students should be directed to e-mail a petition to Lester Manzano, Assistant Dean for Student Academic Affairs, CAS Dean's Office ([lmanzan@luc.edu](mailto:lmanzan@luc.edu))

#### 7. WileyPLUS Assignments:

Organic chemistry is a new language that is spoken in words and structures. The best way to learn a language is to work problems **every day**. The purpose of WileyPLUS assignments is to help you master essential foundational concepts in the course. Remembering and understanding foundational concepts is a prerequisite to **APPLYING** those concepts and analyzing problems: you need to learn the basics first so that you can use them! There will be WileyPLUS assignment sets assigned on Monday, Wednesday, and Friday after each class. Monday's assignment will be due on Wednesday night at 11:59 p.m. CST, Wednesday's assignment will be due on Friday night at 11:59 p.m. CST, and Friday's assignment will be due on Sunday night at 11:59 p.m. CST.

#### 8. Course Repeat Rule:

Effective with the Fall 2017 semester, students are allowed only THREE (3) attempts to pass Chemistry courses with a C- or better grade. The three (3) attempts include withdrawals (W).

After the second attempt, the student must secure approval for the 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 personally meet and obtain a signature from either 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.

#### 9. Norms of Course Proceedings:

The classroom is to be a safe place to question and explore ideas. Student and teacher voices are important to this work. Collegial disagreement can be a healthy part of this process, but must always include respect for all members of the class.

Course activities will be designed to help students reach the goal of learning chemistry content and developing critical thinking skills. This will more often be driven by the use of data and reasoning to

discover concepts and solutions rather than the identification and exchange of chemical facts and algorithms.

**Students are expected to read individually on their own time outside of class.**

Class sessions will begin and end on time. All students should attend class regularly and participate in class discussions. Absences could affect one's ability to learn chemistry during this session. Anticipated absences should be discussed with the instructor two class days before the absence. Proper documents may be requested to verify the reason for any absence. No make-up exams will be granted for any absence during an exam day, no matter what the excuse

Class will start with a ~75-minute live lecture over Zoom, followed by a break. The second portion of the class we will continue with another live lecture and finish with sample problems that I will work on and students will be allowed to ask questions and participate in group discussions regarding the course material being covered. All lectures will be recorded and posted to Panopto.

10. *Sakai Materials*: Handouts given in class will be mirrored on Sakai.

11. *Panopto and Recorded Lectures*:

In this class software will be used to record live class discussions. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the Sakai course is unpublished (i.e. shortly after the course ends, per the Sakai administrative schedule: <https://www.luc.edu/itrs/sakai/sakaiadministrativeschedule/>). Students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Please discuss this option with your instructor.

The use of all video recordings will be in keeping with the University Privacy Statement shown below:

**Privacy Statement**

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.

12. *Academic Honesty*:

All students in this course are expected to have read and abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, that can be viewed at:

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

A basic mission of a university is to search for and communicate the truth as it is honestly perceived. A genuine learning community cannot exist unless this demanding standard is a fundamental tenet of the intellectual life of the community. Students at Loyola University Chicago are expected to know, respect, and practice this standard of personal honesty.

Academic dishonesty can take several forms, including, but not limited to cheating, plagiarism, copying

another student's work, and submitting false documents.

Any instance of dishonesty (including those detailed on the website and provided above) will be reported to The Chair of The Department of Chemistry & Biochemistry who will decide what the next steps may be. You are encouraged to study with other students in and out of class, however, anything submitted for an individual grade during or outside of class must represent your own knowledge and understanding of the material. Evidence of cheating (for homework, quiz, or exam) will result in the minimum of a "zero" on the item (this item cannot be dropped) and penalty up to failure of the course, as well as referral to the Dean's Office.

### 13. *Strategies and Suggestions:*

- The best method of learning organic chemistry is to work the assigned problems and write out the answers. *Then* check your answers versus the Answer Key.
- Study at least 10 hours per week and maintain a steady pace of studying. Organic chemistry continually builds, like a language, so studying some every day is most effective.
- Skim the current chapter before the corresponding lecture, so that you will be aware of the topics to be covered.

### 14. *Practices for Success:*

Supporting claims with evidence, making applications, solving and analyzing problems, and using chemical principles to explain phenomena are critical skills in the field of chemistry. The development of these skills is not without some frustration, but it carries the reward of deepening one's ability to think critically and solve problems in any field. The use of targeted, guiding questions, regularly scheduled work, and strategic study plans can greatly assist the learning of chemistry. With such a focus, hopefully any frustration will quickly turn to appreciation and fascination for the relevance and connectedness of chemistry in your life and within the world around you. Solving and analyzing problems is the most important feature of this work. If, at any time, you need assistance framing such plans for your work in chemistry, please do not hesitate to ask the instructor.

### 15. *Office Hours:*

Office hours will be held over Zoom per the times listed. Please use this time to if you have extra questions regarding this course. If you are unavailable to meet at the listed times, please feel free to email me with any questions. However, if you email me at night (after 6:00 p.m.), on weekends, or during holiday breaks I will respond to your email within 12 hours.

### 16. *Tutoring:*

The tutoring Center at the university offers free tutoring to students. To see the complete tutoring schedule and find additional information, visit the Tutoring Center webpage at [www.luc.edu/tutoring](http://www.luc.edu/tutoring)

### 17. *Student Accommodations:*

If you have special needs, please let me know in the first week of classes. The University provides services for students with disabilities. Any student who would like to use any of these university services should contact the Student Accessibility Center (SAC), Sullivan Center, (773) 508-3700. Further information is available at: <http://www.luc.edu/sac/>

### 18. *Harassment (Bias Reporting):*

It is unacceptable and a violation of university policy to harass, discriminate against or abuse any person because of his or her race, color, national origin, gender, sexual orientation, disability, religion, age or any other characteristic protected by applicable law. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail for this university to fulfill its educational and health care mission. For this reason, every incident of harassment, discrimination or abuse undermines the aspirations and attacks the ideals of our community. The university qualifies these incidents as incidents of bias.

In order to uphold our mission of being Chicago's Jesuit Catholic University—a diverse community seeking God in all things and working to expand knowledge in the service of humanity through learning, justice and faith, any incident(s) of bias must be reported and appropriately addressed. Therefore, the Bias Response (BR) Team was created to assist members of the Loyola University Chicago community in bringing incidents of bias to the attention of the university. If you believe you are subject to such bias, you should notify the Bias Response Team at this link: <http://webapps.luc.edu/biasreporting/>

19. *Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):* Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and receive any notes or other written information distributed in the missed class.

Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation describing the reason for and the date of the absence.

This documentation must be signed by an appropriate faculty member or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time. <http://www.luc.edu/athletheadvising/attendance.shtml>

#### 20. *Accommodations for Religious Reasons*

If you have observance of religious holidays that will cause you to miss class or otherwise effect your performance in the class you must alert the instructor **within 10 calendar days of the first class meeting of the semester** to request special accommodations, which will be handled on a case by case basis.

**Organic Chemistry 224 Tentative Lecture Schedule (subject to change)**

7-4	--	<i>Fourth of July</i>
7-6	14/15	Brief review of IR and MS review/ <sup>1</sup> H and <sup>13</sup> C NMR
7-8	15/16	<sup>1</sup> H and <sup>13</sup> C NMR/Conjugated Pi Systems and Pericyclic Reactions
7-11	16/17	Conjugated Pi Systems and Pericyclic Reactions/ Aromatic Compounds
7-13	17	<b>Quiz 1</b> /Aromatic Compounds
7-15	17/18	<b>EXAM I (Chapters 15-17 or as announced, cumulative) Aromatic</b>
<b><u>Compounds/Substitution Reaction</u></b>		
7-18	18	Aromatic Substitution Reactions
7-20	19	Aldehydes and Ketones
7-22	19/20	<b>QUIZ 2</b> /Aldehydes and Ketones/Carboxylic Acids and Their Derivatives
7-25	20	Carboxylic Acids and Their Derivatives
7-27	20/21	<b>EXAM II (Chapters 18-21 or as announced, cumulative)</b> /Carboxylic Acids and Their Derivatives/Alpha Carbon Chemistry
7-29	21	Alpha Carbon Chemistry
8-1	21/22	<b>QUIZ 3</b> Alpha Carbon Chemistry/Amines
8-3	22	Amines
8-5	22	<b>EXAM III (Chapters 21-22 or as announced, cumulative)</b> /Amines
8-8	24	<b>Quiz 4</b> /Carbohydrates
8-10	25	Amino Acids, Peptides, and Proteins
8-12	--	<b>FINAL EXAM 1:30-3:30 p.m. (cumulative, this includes CHEM 223 materials)</b>