

Description: CHEM 225 is a course about laboratory techniques used in organic chemistry. In this course, students will learn how to handle organic chemicals safely, characterize organic compounds by measuring selected physical properties, purify organic compounds, and determine the structures of organic compounds. Lastly, students will learn how to prepare for a chemical reaction that is designed to convert one organic compound into a different substance and then analyze the results of the reaction.

Pre-requisites: Grade of 'C-' or better in 1 year of General Chemistry Lecture and Lab.

Required Items: This is an online-only course, and therefore a desktop or laptop computer with high-speed Internet access is required. Some of the virtual lab simulations used in this course DO NOT work on tablets or mobile devices. Wired (ethernet cable) internet is preferred, but WI-FI is acceptable if the connection is reliable. If students do not have a personal desktop/laptop computer or Internet service, they need to contact Loyola ITS for information on the [equipment loan program](#) before or within the first few days of the start of the course and arrange for these resources. The lab instructor is not responsible for coordinating this for students.

Recommended Materials: Bound composition notebook

Course Homepage: Announcements, assessments, videos, the grade book, office hour times etc. are posted on the course site at Sakai.luc.edu. For this course, all materials and due dates will be posted under the "Lessons" tab. Students should familiarize themselves with the layout of the course Sakai page and check it frequently.

Schedule: This course is set up to run online and asynchronously, but students will be able to reach the instructor and TA throughout the course via email. There will also be optional office hour sessions open to all students via Zoom at multiple times during the week. The times for these will be posted on Sakai. The course will follow a weekly schedule, and the course materials will be posted under the "Lessons" tab on Sakai. Students are expected to read through the uploaded files, watch the posted videos, and work their way through the assignments at their own pace throughout the week. **Most assignments are due weekly on Mondays at 8:00am.** Exceptions to this are noted on Sakai and include a one-day delay due to the Labor Day holiday near the start of the term and also the hard deadline on Saturday at the end of the term. Note: all times indicated for this course are in Central Time; central daylight savings time applies through November 7, 2021 after which central standard time returns.

Contacts:
Instructor: Dr. Jessica Eisenberg, jeisenberg2@luc.edu
Instructor: Mr. Tim Thomas, tthoma1@luc.edu
Teaching Assistant: Monika Rasic, mrasic@luc.edu

Email: Faculty email addresses are posted on the open Internet for every software bot and spammer in the world to see. Therefore, faculty Outlook accounts are configured differently, and emails from outside sources are often blocked automatically and sent to the junk folder. Because of this and a Federal law relating to student privacy (FERPA), students must use a Loyola email address when contacting the instructor or TAs about this course. In the subject line of an email, please indicate your 225 section number.

Role of the TA: A teaching assistant is assigned to lab sections to aid the instructor in giving help and feedback to the students in the course. The TA's primary responsibilities include answering student questions, facilitating conversations in the course Forums, and grading certain assignments. Students should primarily email questions to the instructor and/or the TA assigned to their registered section, but should feel free to attend Zoom sessions for anyone since all course sections are set up following the same guidelines. If at any time during the semester, questions or concerns arise about the behavior of a TA, please contact the instructor.

Grading: Lab grades will use the following scale and consist of the following components:

A>93%, A->90%, B+>87%, B>83%, B->80%, C+>77%, C>73%, C->70, D+>67%, D≥60%, F<60%

Miscellaneous assignments (SciFinder, ChemDraw, Stoichiometry)	10%
Technique Knowledge Checks	35%
Labster Simulations	35%
Forums	10%
Synthesis Lab Write-up	<u>10%</u>
	100% total

SciFinder Scholar Assignment: This assignment familiarizes students with an authoritative, reliable resource to consult in order to find physical property data on organic chemicals. These known values are used to compare to the lab-measured values in order to gauge experiment success. **This assignment has unlimited submissions and no time limit up until the due date posted on Sakai.** The highest score will be recorded in the Sakai Gradebook. Students with no submission attempt before the due date will be allowed only one late submission up to 1 week after the posted due date with a 50% late penalty.

ChemDraw Assignment: This assignment introduces students to a chemical structure drawing program and some of the features it contains. **This assignment allows one initial submission with no time limit up until the due date posted on Sakai; no late submissions on the first attempt will be accepted.** Once the initial submissions have been graded, feedback will be viewable under “Tests & Quizzes” and a retake option will be released. All students are allowed unlimited submissions on the retake up until the course hard deadline. The average score between the initial submission and the highest retake will be entered into the Sakai Gradebook; if no retake is submitted, the initial score will be recorded.

Stoichiometry Assignment: This assignment reviews the important stoichiometry calculations that are needed while preparing and analyzing the results of synthesis experiments. **This assignment has unlimited submissions and no time limit up until the due date posted on Sakai;** the highest score will be recorded in the Sakai Gradebook. Students with no submission attempt before the due date will be allowed only one late submission up to 1 week after the posted due date with a 50% late penalty.

Technique Knowledge Checks: In order to explain and demonstrate various organic chemistry lab techniques in an online-only lab, much the content is contained in videos that are posted on Sakai. Some of the videos and presentations were prepared by the course instructors and show the use of equipment and materials in Loyola’s organic chemistry lab space. Other videos are from the Journal of Visualized Experiments ([JoVE](#)), a peer-reviewed scientific video journal that shows the experiments being performed in laboratories at research institutions worldwide. After watching the provided video(s) on a given topic, students are asked to answer the questions in the corresponding Knowledge Check to demonstrate their understanding of the techniques. **These assignments allow unlimited submissions and no time limit up until the due date indicated on Sakai; the highest score will be recorded in the Sakai Gradebook.** Students with no submission attempt before the due date will be allowed only one late submission up to 1 week after the posted due date with a 50% late penalty. Assessments must be submitted to count. Spelling, grammar, and significant figures apply in order to receive full credit.

Labster Simulations: [Labster](#) is another way to give students exposure to laboratory procedures that also includes the ability to manipulate a variety of experiments in a virtual space. Students should complete the different Labster simulations during the weeks that will be noted in the “Lessons” tab on Sakai. The links to the actual simulations are located on Sakai under the “Labster” tab. Points will be awarded as students work through the simulations by answering quiz questions and completing simulated lab tasks. Student progress is saved after certain stages of the simulations, allowing students to stop working and resume at a later time if so chosen. The score from a student’s “best completed attempt” at a simulation (i.e.; the highest score for

a simulation at 100% completion) will be entered into the Sakai Gradebook. There are recommended due dates for Labster, but all of the simulations will remain open and available to students to complete for the duration of the course and may be repeated as often as desired. **Labster will turn off at 5:00pm on Saturday, December 11, 2021, and no scores will be accepted after this.**

Forum Posts: Throughout the course, students are asked to respond to a prompt that the instructor will post under the course “Forums” tab on Sakai. A link to each topic will also be posted in the corresponding folder under the “Lessons” tab. The purpose of the weekly Forums is to give students the chance to discuss ideas and questions related to various organic lab topics amongst themselves, with additional input from the instructor and TA. In order to receive full credit for the weekly Forum Posts, students should first **WRITE 1 post** containing a meaningful comment related to the prompt and then **READ AND RESPOND to at least 2 posts** from fellow students relating to the weekly topic. Note that in order to “read” a post in the Forums, students can either: 1) click on the title of the post until the message is fully opened, or 2) click on the “mark read” button that appears if viewing the post in “preview” mode. There is more information of how to do both of these options on Sakai, but unless one of those two options is followed, the posts will not be considered to be “read” and will not be counted. Forum posts must be written and read by the weekly due dates. **Because the Forum posts are a means to facilitate collaborative weekly discussions in an asynchronous online course, the Forums will close on the posted due dates indicated on Sakai, and there will be no late submissions accepted.**

Synthesis Lab Write-Up: To demonstrate their ability to fully analyze an experimental procedure and the results as well as practice their scientific writing skills, students will complete one formal lab write-up over a synthesis virtual experiment towards the end of the course. Students will complete this assignment based on information provided in a background video as well as a virtual lab video that will be posted in the corresponding “Lessons” folder on Sakai. The virtual lab video consists of the instructor performing the experiment in the organic chemistry lab at LUC (just as a student would do if in-person) and documenting the experiment in a narrated presentation using photographs and/or videos taken as the experiment was being performed. Students will watch this presentation and write up the details and results of the experiment following the format posted on Sakai. Submission of this lab write up will be done and submitted via Sakai. The short answer essays for this write up should be clearly written in past tense to describe what happened and what was observed during the experimental presentation – everything should be written up with proper scientific grammar (do not use first person tense like “I did this” or “we saw this”; use past tense, passive voice throughout). **Students are only allowed one lab write-up submission;** if no prior submission has been made before the posted due date, one late submission will be allowed through the course hard deadline, but it will receive an automatic 25% late deduction.

Late Policies and Hard Deadline: In order to keep students on track throughout this course, assignments are due on a weekly basis. The specific due dates for each assignment are posted under the “Lessons” tab on Sakai within the topic folders using an assignment check-list feature. See the additional notes included with each assignment type above for the policies regarding late assignment submissions. **The hard deadline for the submission of all assignments is 5:00pm on Saturday, December 11, 2021.** Final grades will be calculated based on materials submitted by this hard deadline. If there are substantial materials that are missing and that cannot be submitted before this deadline, the student should consider withdrawing from the course or requesting an Incomplete by completing [this form](#) prior to the end of the term.

Re-grades: All requests to have items re-graded must be submitted in writing within one week after the graded materials are returned to the student.

Academic Integrity: All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at: <http://www.luc.edu/cas/advising/academicintegritystatement/> A basic mission of a university is to search for

and to 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 of Loyola University Chicago are expected to know, to respect, and to 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 provided above or in this syllabus) will be reported to the Chair of the Department of Chemistry & Biochemistry, who will decide what the next steps may be. The penalty for academic dishonesty is a zero on the assignment and a possible letter grade reduction of the final course grade.

Copyright/Privacy Statements: Course content is designed for use ONLY by students in this course. All materials are subject to privacy and copyright laws. Students are NOT allowed to share any course resources (Labster info, Panoptos, PowerPoints, quiz/test/exam questions, documents, etc.) with anyone not registered for the course, nor are students allowed to upload, post, copy, share them to any outside media sites without explicit permission from the instructor. If discovered that a student completes such action, the Chair of the Chemistry & Biochemistry Department will be notified immediately.

Course/Instructor Evaluation – SmartEval: The following information came from the University regarding course evaluations:

“Towards the end of the course, the students will receive an email from the Office of Institutional Effectiveness reminding them to provide feedback on the course. They will receive consistent reminders throughout the period when the evaluation is open, and the reminders will stop once they have completed the evaluation.

-The evaluation is completely anonymous. When the results are released, instructors and departments will not be able to tell which student provided the individual feedback.

-Because it is anonymous and the results are not released to faculty or departments until after grades have been submitted, the feedback will not impact a student's grade.

-The feedback is important so that the instructor can gain insight into how to improve their teaching and the department can learn how best to shape the curriculum.”

Course Repeat Rule: 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 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.

Student Accommodations: Loyola 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/>.

Topics Covered: (Note: the final schedule will be noted on Sakai.)

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| 1: Lab Safety and Glassware/Equipment | 8: Distillation |
| 2: Organic Structures and Using ChemDraw | 9: Recrystallization |
| 3: Functional Groups: Chemical Tests | 10: Liquid-Liquid Extraction |
| 4: Infrared Spectroscopy | 11: Chromatography |
| 5: Using SciFinder Scholar | 12: Substitution and Elimination reactions |
| 6: Phase Changes: Melting and Boiling Points | 13: Synthesis of Cyclohexene |
| 7: Chemical Isomers and Polarimetry | |