

Description: CHEM 226 is a laboratory course designed to create foundational knowledge and proficiency in essential organic chemistry concepts and laboratory skills. It includes hands-on experiments designed to teach laboratory skills needed to perform organic chemistry reactions and to isolate and characterize organic compounds.

Meeting Times and Locations: All sections of CHEM 226 meet in LSB 115.

Section Number	Days and Times	Instructor
001	Tu/Th 8:30AM - 11:15AM	Dr. Eisenberg
002	Tu/Th 12:30PM - 3:15PM	Mr. Thomas

Office Hours: Office hours for the instructors and TAs will be posted on Sakai.

Pre-requisites: Grade of 'C-' or better in (CHEM 223 and CHEM 225) or CHEM 221.

Required Items: The course materials, including the lab procedures and background material, are posted on the course homepage, which is called Sakai. There is no printed lab manual or textbook. Some of the materials posted on Sakai DO NOT work on tablets or mobile devices. Therefore, access to a desktop or laptop computer with high-speed Internet access is required. Wired (ethernet cable) internet is preferred, but WI-FI is acceptable if the connection is reliable. If you do not have a desktop/laptop computer or Internet service and/or are unable to access a computer lab on campus, you need to contact Loyola ITS (Information Technology Services) for information on their 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.

Materials: Bound Composition Book
Full-length lab coat
Safety goggles (will be provided during safety training)

Course Homepage: Announcements, assessments, extra copies of the handouts, the grade book, etc. are posted on Sakai.luc.edu. Students should check Sakai frequently as it is central to how the course operates.

Safety Rules: Students must read the safety rules posted on Sakai very carefully and follow them throughout the course. Students must also demonstrate their safety knowledge by completing an online Lab Safety Quiz that is posted on Sakai with a score of 5/5 before they will be allowed to work in lab. Anyone who does not adhere to the safety rules will receive point deductions and may not be allowed to remain in the laboratory. Students must bring eye protection and a full-length lab coat to every experiment. Students must also dress in appropriate clothing and footwear such that there is no exposed skin at any point below the shoulders. For the sake of hygiene and other reasons, students may not borrow goggles and/or a lab coat. **ANY STUDENT WHO COMES TO THE LAB WITHOUT THESE ITEMS WILL NOT BE ALLOWED TO PERFORM THE EXPERIMENT.** More information on the course attendance policy can be found below.

Grading: Course grades consist of the following components:

Pre-lab Exercises, drop lowest one	20%
Lab Notebook Submissions, drop lowest one	20%
Data Collections, drop lowest one	20%
Post-lab Exercises, drop lowest one	20%
2 Lab Reports	20%
	100% total

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

Attendance: Students are expected to attend every lab session. **Any student who does not have their safety goggles or lab coat, is not dressed appropriately, or has not completed the pre-lab exercises before lab starts as described below, will be marked absent.** Missing a lab period for any reason will result in a zero for any work that is not completed. Regardless of attendance, the lowest pre-lab, notebook, data, and post-lab

score will be dropped from the overall grade calculation for all students. Additionally, points for one experiment can be earned back by completing a Labster simulation. If a student is absent for any reason during the term, the student can request to complete the makeup work by emailing their instructor within 24 hours of the missed experiment. If a student misses lab twice, they can make up the points associated with one of the labs, and the other missed lab scores will be dropped. Any additional missed work beyond two absences will automatically receive a zero.

There will be an attendance sheet that students are required to sign upon entering the lab. It is critical that the attendance sheet exactly matches who is present in the lab in the event of an emergency. If someone must leave the lab after signing in (e.g., to use the restroom, get a drink of water, etc.) they must be sure to log out on the attendance sheet. For safety's sake and to get better results, limit time out of the lab. Students who leave the lab for a period longer than 10 minutes, arrive late, and/or do not sign in on the attendance sheet themselves may receive a deduction for their Data Collection points for that experiment.

Pre-Lab Preparation: Success in organic lab depends on advance preparation. Therefore, there are several things you must do before coming to lab. The major component of your pre-lab assignment is to thoroughly read and understand the experimental procedure and the assigned background reading listed on Sakai. Additionally, before coming to class, students must complete the pre-lab exercise via Sakai. Some of the pre-lab questions come directly, word-for-word, out of the reading assignments to ensure students are completing the readings. Students are allowed unlimited attempts until the due date, and assessments must be submitted to count. Spelling, grammar, and significant figures count. No late pre-labs will be accepted.

STUDENTS WHO DO NOT COMPLETE THE PRE-LAB WILL NOT BE ALLOWED TO PERFORM THE EXPERIMENT!

Lab Notebooks: The ability to keep good records is a valuable skill that is widely applicable in fields beyond chemistry. As such, students are required to record their experimental notes and results for every experiment. Proper lab documentation should always be completed **AS THE EXPERIMENT IS PERFORMED IN CLASS**. One of the most important facets of experimental work is that data should be recorded as completely and accurately as possible. Sometimes, important discoveries are made when things do not behave as expected. Therefore, it is critical that students report their actual data and not what it is thought that the correct answer should be. Lab notebook entries should be written **DURING LAB**. After the lab is completed, the pages will then be scanned and uploaded to Sakai before the beginning of the next lab period to maintain a digital record of the work as well as for grading purposes. Additional instructions for the format of notebook pages and the submission process are posted on Sakai and must be followed to earn full credit.

Data Collections: At the end of each experiment and before leaving lab, all students must report their experimental data to the Teaching Assistant to obtain the Data Collection points. The TA will confirm all aspects of the lab were completed and record the students' results on the daily attendance sheet. If results are not reported, the data can be emailed to the TA before the start of the next lab period, but it will only be worth half credit. No data will be accepted after the start of the next lab period. Any portion of the experiment that is not completed by the end of the lab period could result in a loss of Data Collection points. Students who honestly report all their experimental results will receive full credit for the Data Collection points. Anyone caught making false claims about their results will automatically receive a 0 for that experiment.

Post-Lab Exercises: A series of questions about each experiment will become available on Sakai after the experiment ends. Students are allowed unlimited attempts until the due date, and assessments must be submitted to count. Spelling, grammar, and significant figures count.

Lab Reports: A formal type-written lab report that follows the guidelines of the American Chemical Society will be required for two of the experiments. Additional instructions will be posted on Sakai.

Required Labster Simulations: Labster is another way to give students exposure to laboratory procedures that includes the ability to manipulate a variety of experiments in a virtual space. All students should complete the Labster simulations during the weeks that will be noted in the "Lessons" tab on Sakai. The required Labster simulations help to keep all the sections on the same schedule around holidays and reinforce the course

material. 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 later 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) by the due date will be manually entered into the appropriate section of the Sakai Gradebook. Labster simulations will remain open and available to students to complete for the duration of the course and may be repeated as often as desired. However, scores will be “locked” as of the specified due dates and transferred to the Sakai Gradebook. Labster simulations that are assigned as part of the pre-lab preparation for an experiment must be completed by the start of a specific lab period. Scores from Labster simulations that are assigned as post-labs will be locked on the due date. The Labster tab will turn off at 5:00 PM on Thursday, August 11, 2022, and no scores will be accepted after this.

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.

Late Policy: Materials that are submitted after the designated due date but up to 48 hours after the designated due date, will receive a 25% deduction. No materials will be accepted that are more than 48 hours late.

Hard Deadline: All materials of any kind must be submitted by 5 PM on August 12, 2022. No materials will be accepted after this time. This hard deadline supersedes any other normal deadlines and the normal late policy. Final grades will be calculated based only on materials submitted by this 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.

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 an outside contractor also scans faculty email. Emails from outside sources are often blocked automatically. Because of this and a federal law relating to student privacy (FERPA), students must use a Loyola email address when contacting the TAs or the instructor about this course. In the subject line of an email, please put Chem 226-section number and TA’s name.

Interactions with TAs: To increase the amount of individual assistance you receive in lab, Teaching Assistants will participate in delivering this course. If at any time during the semester you have any questions or concerns about the behavior of your Teaching Assistant, please contact the instructor.

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 at 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) will be reported to The Chair of The Department of Chemistry & Biochemistry, who will decide what the next steps may be. The penalty may include a grade of zero for that assignment and/or failure of the course.

Health, Safety, and Well-Being On-Campus: Please be familiar with and adhere to all policies and protocols posted on the Campus Info & Resources site: <https://www.luc.edu/healthsafetyandwellbeing/campusinforesources/>

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). The Department advises that it is preferable to complete a course with a grade of C or C-, and to demonstrate growth in future coursework, than to withdraw from a course.

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: <https://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: The Student Accessibility Center (SAC, formerly known as SSWD), Sullivan Center (773-508-3700), <http://www.luc.edu/sac>, has the mission “to support, service, and empower Loyola University Chicago students with disabilities” and to “Partner with faculty and staff to provide opportunities for collaboration, professional development, personal growth, and staff interaction, as they relate to students with disabilities.” Please direct all questions concerning accommodations of disabilities to the Student Accessibility Center. Academic accommodations afforded to students require documentation and review. The Student Accessibility Center will issue accommodation letters for registered students to present to their instructors; accommodations are not active until students present these letters to their instructors. If students’ accommodations involve attendance or deadlines, instructors and students will jointly complete and execute an Agreement Form articulating their terms. See <https://www.luc.edu/sac/faculty/facilitatingaccommodations/> for guidance about implementing various kinds of accommodations in a way that is appropriate to your class. The Student Accessibility Center stands ready to work with you.

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 to receive notes or other written information distributed in the missed classes. 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 date of the absence. This documentation must be signed by an appropriate faculty 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. (<https://www.luc.edu/athletheadvising/attendance.shtml>).

Accommodations for Religious Reasons: If you have observances 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.

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.

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Experiments

1. Rotary Evaporation, Control of Reaction Temperature, Notebook Preparation, Lab Safety
2. Synthesis of Benzoic Acid
3. Thin-Layer and Column Chromatography
4. NMR (Nuclear Magnetic Resonance) Spectroscopy
5. Carbonyl Olefin Metathesis
6. Diels-Alder Reaction of Anthracene and Maleic Anhydride
7. Fischer Esterification: Preparation and Identification of an Unknown Ester
8. Identification of an Unknown Ketone
9. Aldol Condensation
10. Acylation of an Aromatic Amine and Synthesis of Nylon