Description: This course 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	Day and Time	Instructor
001	Mo 10:25AM - 1:10PM	Dr. Eisenberg
002	Tu 8:30AM - 11:15AM	Dr. Eisenberg
003	Tu 11:30AM - 2:15PM	Dr. Eisenberg
004	Tue 5:45PM - 8:30PM	Mr. Thomas
005	We 11:30AM - 2:15PM	Mr. Thomas
006	We 2:45PM - 5:30PM	Mr. Thomas
007	Th 8:30AM - 11:15AM	Dr. Eisenberg
008	Fr 8:30AM - 11:15AM	Dr. Eisenberg
009	Fr 11:30AM - 2:15PM	Mr. Thomas
010	Sa 10:00AM - 12:45PM	Mr. Thomas

Office Hours: Office hours for the instructors and TAs will be via Zoom. Days and times will be posted on Sakai.

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

Required Materials:
Bound composition book
Full-length lab coat
Safety goggles (will be provided during the first day of class)

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.

Grading: Course grades consist of the following components:

Pre-lab Exercises	20%
Safety/Technique/Product (STP) Points	20%
Notebook pdf Submissions	20%
Exam 1	20%
Exam 2	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%

Safety Rules: Students must read the safety rules posted on Sakai very carefully and follow them throughout the course. Students must also score a 5/5 on the online Safety Quiz that is posted on Sakai before they are 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 LAB WITHOUT THESE ITEMS WILL NOT BE ALLOWED TO PERFORM THE EXPERIMENT.**

Pre-Lab Preparation: Success in organic lab depends on advance preparation. Therefore, students must do several things before coming to the lab. One major component of the pre-lab assignment is to thoroughly read and understand the experimental procedure and any assigned background material posted on Sakai. Additionally, before coming to class, students must watch the Safety and Setup video posted on Sakai. There

are questions embedded into each video that as the Pre-lab Exercises for that experiment. To ensure that everyone comes prepared to lab, the instructors/TAs will be checking that the required video was watched and that the questions were answered. Therefore, students must watch the videos and answer the questions **AT LEAST ONE HOUR BEFORE CLASS BEGINS.** Students who do not watch the online safety and setup video and answer the questions contained in the video will not be allowed to perform the experiment!

Lab Notebooks: The ability to keep good records is a valuable skill. Students are required to record their results in a laboratory notebook. A properly maintained notebook will make an experiment easier and helps to keep experimental results all in one place. For this course, the content needed for the prelab notebook sections of each experiment will be provided on Sakai. The portions you will complete consist of the balanced chemical equation, the procedure, the results (including a percent yield calculation), and a short discussion. ALL THESE SECTIONS SHOULD BE COMPLETED IN CLASS. Before leaving the lab, students must show their products to their TA and get their notebook pages initialed. Notebook pages that are not initialed will not earn points when submitted on Sakai (see below).

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 don't 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. Students who complete the entire experiment in good faith will still receive Notebook Submission points AS LONG AS THE NOTEBOOK ACCURATELY REFLECTS WHAT HAPPENED DURING THE EXPERIMENT.

Notebook pdf Submissions: At the end of each experiment, students must scan their notebook pages and convert them to a single pdf file, which must be submitted via Sakai within 24 hours of the end of the experiment. To receive credit, the file must be legible, and it must be in the pdf format. Notebook points will be awarded based on things such as accuracy, completeness of the data, identification of unknowns, etc. Notebook pages that are not initialed will not earn points when submitted on Sakai.

Safety/Technique/Product (STP) Points: After the experiment is completed and before leaving the lab, students must show their TA their product and their notebook pages. The TA will record the characteristics of the product, such as mass, melting point or boiling point, appearance, etc. The TA will also witness and initial the students' notebook pages. The TA will confirm the students have properly cleaned their glassware and returned it to their drawer. Failure to check out completely with the TA will result in a loss of a portion of the STP points. Point deductions may also be made for safety violations, glassware breakage, chemical spills, not participating in collecting the data, not finishing the experiment, etc

Labster Simulations: There will be three required Labster simulations that cover NMR spectroscopy near the beginning of the semester. There are unlimited attempts until the due date, and the best score will be recorded. The average of the three Labster simulation scores will count as the equivalent of one STP Point score.

Lab Exams: There will be two exams. Both exams will include material covered in class and posted on Sakai, as well as some prerequisite material. Be sure to bring a No. 2 pencil and Student ID.

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.

Attendance: Students are expected to attend every lab session. Missing a lab period will result in a zero for any work that is not completed. However, points can be earned back by completing a makeup. To request a makeup, the student must contact the instructor via email within 24 hours of the missed experiment. If the makeup is approved by the instructor, the student and the instructor will attempt to arrange an acceptable makeup time to perform the experiment. Makeups are subject to the safety constraints and size limitations of the room. To ensure that the necessary chemicals and equipment are prepared, the makeup must be approved by the instructor and the student must also have completed the prelab exercises at least 24 hours before the makeup starts. Makeups must be completed within two weeks of the missed experiment because chemicals and equipment are returned to the stockroom. If no acceptable makeup time can be arranged, the student will be provided with a link to a video of the experiment being performed. The student will submit

notebook pages based on the video, and the student's percentage score from the next exam will be substituted for the missing STP points.

Students who miss an experiment are still responsible for all the material on exams. Students are allowed at most TWO absences during the course. Any additional missed work beyond two experiments cannot be made up.

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 will receive a deduction from the Results points for that experiment.

Late Policy: There will be a 10% deduction if an assignment is submitted up to 24 hours after the designated due date, a 25% deduction if submitted 24-48 hours late, a 50% deduction if submitted 48-72 hours late, a 75% deduction if 72-96 hours late, and no assignment will be accepted more than 96 hours after the posted due date.

Hard Deadline: All materials of any kind must be submitted by 6 PM on April 29, 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 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) 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/

Spring 2022 Masking Requirement: Even in the event the University relaxes its universal requirement for indoor mask-wearing during the Spring 2022 semester, Departmental policy is that, out of respect for the health of housemates and others in regular contact with members of our community, in this class we will continue to properly wear our masks at all times (e.g., over nose and mouth).

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/athleteadvising/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.

Recording of Zoom class meetings: 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 course has concluded. Students will be required to turn on their cameras at the start of class. Students who have a need to participate via audio only must reach out to the instructor to request audio participation only without the video camera enabled. 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.

Contacts: Dr. Eisenberg, LSB 124, (773) 508-8714, jeisenberg2@luc.edu
Mr. Thomas, LSB 124, (773) 508-8115, tthoma1@luc.edu

Experiments

Experiment	Skills
Safety/ NMR Spectroscopy	PPE, chemical hygiene, waste disposal, structure determination
Nitration	Lab notebook preparation, handling strong acids, recrystallization, adjusting rxn conditions
Diels-Alder	Reaction at high T, reflux
Ketone Unknowns	Buffers, derivative formation, ref. index, BP, compound identification
Aldol Condensation	Reaction produces primarily the most stable product, recrystallization
Grignard	Handling water sensitive reagents, extraction, MP
Esterification	Reflux, Le Châtelier's Principle, extraction, distillation, BP, ref. index, NMR
NMR Unknowns	NMR sample prep, spectrum acquisition and processing, interpreting spectra (^{1}H and ^{13}C)
Acylation of an Aromatic Amine/ Nylon Synthesis	Buffering a reaction, interfacial reaction