

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, how to characterize organic compounds by measuring selected physical properties, how to purify organic compounds, and how to determine the structures of organic compounds. Lastly, students will 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 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 you do not have a desktop/laptop computer or Internet service, you need to contact the [Information Commons extended loan equipment program](#) within the first few days of the start of the course and arrange for these resources. The lab instructor is not responsible for coordinating these resources for students.

Recommended Materials: Bound composition notebook

Course Homepage: Announcements, assessments, videos, the grade book, etc. are posted on Sakai.luc.edu. Students are responsible for all of this material, so you should familiarize yourself with Sakai and check it frequently.

Meeting Times and Locations: All sections of CHEM 225 meet online for Fall 2020

Section Number	Day and Time	Instructor
001	Mondays 12:10 PM - 2:55 PM	Dr. Eisenberg
002	Mondays 4:10 PM - 6:55 PM	Mr. Thomas
003	Tuesdays 8 AM – 10:45 AM	Dr. Eisenberg
004	Tuesdays 11:30 AM – 2:15 PM	Dr. Eisenberg
005	Wednesdays 8:10 AM – 10:55 AM	Dr. Eisenberg
006	Wednesdays 12:10 PM - 2:55 PM	Dr. Eisenberg
007	Wednesdays 4:10 PM - 6:55 PM	Mr. Thomas
008	Thursdays 8 AM – 10:45 AM	Dr. Eisenberg
009	Thursdays 11:30 AM – 2:15 PM	Mr. Thomas
010	Tuesdays 6:15 PM - 9:00 PM	Mr. Thomas
011	Fridays 12:10 PM - 2:55 PM	Dr. Eisenberg
012	Fridays 4:10 PM - 6:55 PM	Mr. Thomas
013	Saturdays 10 AM – 12:45 PM	Mr. Sara

Schedule: This course is set up to run asynchronously, but it will follow a weekly schedule. New materials will be released at the beginning of class each week under the "Lessons" tab on Sakai. Class times are shown in the table above. All times are Central Time. 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 until the due date, which is typically at the end of class the following week. Students will be able to reach the instructor and TA throughout the course via email. There will be also "live-help" sessions via Zoom at multiple times during the week. The times for these will be posted on Sakai.

Contacts:
Instructor: Dr. Jessica Eisenberg, jeisenberg2@luc.edu
Instructor: Mr. Tim Thomas, tthoma1@luc.edu
Instructor: Mr. Matt Sara, msara@luc.edu

Grading: Lab grades will consist of the following components:

Knowledge Checks	25%
Data Analysis	25%
Labster Simulations	25%
Synthesis Lab Notebook	10%
Forum Posts	<u>15%</u>
	100% total

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

Knowledge Checks: Since this is an online-only course, the content consists primarily of simulations and videos posted on Sakai. The simulations come from a company called Labster, and access to Labster is included in the course. Many of the videos are from the Journal of Visualized Experiments (JoVE), a peer-reviewed scientific video journal that shows experiments from laboratories at research institutions worldwide. Some of the videos were also prepared by the course instructors. Each video has a corresponding Knowledge Check. After watching the required videos, students should answer the questions in the corresponding Knowledge Check. A link to each Knowledge Check will be located below the posted video(s) and will also show up under the "Tests & Quizzes" tab on Sakai. **Students are allowed unlimited attempts on Knowledge Checks until the due date. Students with no submission prior to the due date will only be allowed one late submission for up to 24 hours past the due date and will receive an automatic 10% late deduction.** All assessments must be submitted by the student to count. Spelling, grammar, and significant figures apply in order to receive full credit.

Data Analysis: For each JoVE experiment, students will answer a series of questions about sample data for that experiment. Students are to answer the questions as if they had performed the experiment themselves. **One attempt is allowed for each Data Analysis, and the work must be submitted by the due date to count; no late submissions for the first attempt will be permitted.** After the due dates for all the sections have passed, the initial scores will be released, and a re-take of the Data Analysis will become available to all students. The re-take will allow multiple attempts. However, since there are hand-graded items, some time may elapse before the Instructors and TAs can score the work. We will make every effort to grade re-takes within one week. The grade recorded for each Data Analysis will be the average of the original attempt and the highest score on the re-takes. The final due date for all Data Analysis re-takes will be Saturday, December 5 at 12:45 PM CST. The only exception to this is the Data Analysis for Chromatography, which has unlimited attempts instead of a retake, and the best score will be recorded in the gradebook.

Labster Simulations: Labster gives students exposure to laboratory procedures and the ability to manipulate a variety of experiments in a virtual space. Students will complete 7 different Labster simulations during weeks that will be noted in the weekly "Lessons" folders 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, but all of the simulations will remain open and available to students for the duration of the course and may be repeated as often as desired. Labster will turn off at 12:45 PM on Saturday, December 5, 2020, and no scores will be accepted after this.

Synthesis Lab Notebook: The majority of the course is about learning the laboratory techniques necessary to do chemical synthesis. In synthesis, chemical reactions are performed in order to convert organic compounds into new substances. Performing a synthesis often requires many different lab techniques in order to run the reaction, to workup the reaction, and to isolate and characterize the products. Reproducibility is an important part of science, so thoroughly documenting experiments in a lab notebook and formatting synthesis results for presentation to others will also be a portion of your course grade. For this course, students will complete one synthesis lab notebook entry using information provided in a background video and a virtual lab video that will be posted in the "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) 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 lab notebook format posted on Sakai in the "Lessons" folder; a sample lab notebook entry is also posted there for reference. The completed hand-written notebook pages must then be scanned (using either a flatbed scanner/copier or a smartphone app), converted into a single PDF file, and submitted on Sakai following the posted link in the appropriate "Lessons" folder or under the "Assignments" tab.

Even though students in an online course are not performing these experiments personally, the lab notebooks are meant to be done in a way to mimic the in-person lab experience and practice recording experimental procedures, observations, and results. Therefore, much of a lab notebook is written while the experiment is being performed, so a lab notebook is not meant to be "perfect," meaning it may contain spelling errors, abbreviations, scribbled out sections, etc. Notebook points will be awarded based on things such as correct calculations, accuracy, completeness of the data and observations, identification of unknowns, etc. Additionally, in order to receive full credit, the file must be legible and a PDF. Students are only allowed one notebook submission per virtual experiment. If no prior submission has been made before the due date, one late submission will be accepted according to the course's late policy.

Forum Posts: Every week, students are expected 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 weekly 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 at least 1 post** containing a meaningful comment related to the prompt and then **READ at least 3 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 end of the student's lab section course time the week after the particular forum opens. **Because the Forum posts are a means to facilitate collaborative and active weekly discussions in an asynchronous online course, note that there will be no points awarded for late Forum posts.**

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

Late Policy: Unless otherwise specified, materials that are submitted late but on the same date as they were due will receive a 10% deduction. There will be an additional 25% deduction for each day or portion of a day, including weekends, they are late after that.

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. 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 225- section number and TAs name.

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: 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/>.

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 (develop standard form on web) 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.

Hard Deadline: All materials of any kind must be submitted by 5 PM on December 5, 2020. 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 materials submitted by this deadline. If there are substantial materials that are missing and that cannot be submitted before this deadline, the student should request an Incomplete by completing [this form](#) and presenting it to their instructor prior to the close of the semester.

Syllabus Statement Regarding Course Recordings

In this class software may 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](#)). 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.

Topics by Class Period: Tentative, Subject to Change

Week 1 (Aug 24-29): Course Introduction, Labster: Chemical Safety

Week 2 (Aug 31-Sept 5): Chemistry Information Resources

Week 3 (Labor Day Sept 7-12): Labster: Organic Chemistry Introduction, Chemical Structure Drawing

Week 4 (Sept 14-19): Functional Group Identification: Chemical Tests, Infrared Spectroscopy

Week 5 (Sept 21-26): Labster: Ionic and Covalent Bonds

Week 6 (Sept 28-Oct 3): Melting Point & Boiling Point Determination

Week 7 (Oct 5-10): Labster: Matter and Phase Changes

Week 8 (Oct 12-17): Distillation

Week 9 (Oct 19-24): Recrystallization & Extraction

Week 10 (Oct 26-31): Labster: Nucleophilic Substitution Reaction

Week 11 (Nov 2-7): Labster: Elimination Reactions

Week 12 (Nov 9-14): Lab Notebook: Synthesis of Cyclohexene

Week 13 (Nov 16-21): Chromatography

Week 14 (Nov 23-28): THANKSGIVING (NO CLASSES)

Week 15 (Nov 30-Dec 5): Labster: Substitution vs. Elimination