

Description: CHEM 226 is the second semester of organic chemistry laboratory. In this course, students learn how to run organic chemical reactions and how 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 11:30AM - 2:15PM	Dr. Eisenberg
002	Mo 2:45PM - 5:30PM	Mr. Thomas
003	Tu 8:30AM - 11:15AM	Dr. Eisenberg
004	Tu 11:30AM - 2:15PM	Mr. Thomas
005	We 6:00PM - 8:45PM	Mr. Thomas
006	We 8:30AM - 11:15AM	Dr. Eisenberg
007	We 11:30AM - 2:15PM	Mr. Thomas
008	We 2:45PM - 5:30PM	Mr. Thomas
009	Th 11:30AM - 2:15PM	Dr. Eisenberg
010	Fr 11:30AM - 2:15PM	Dr. Eisenberg
011	Fr 2:45PM - 5:30PM	Dr. Eisenberg
012	Th 8:30AM - 11:15AM	Dr. Eisenberg

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

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

Recommended Materials: Making the Connections³ By Anne B. Padias (ISBN: 978-0-7380-7436-8)

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:

Lab Safety Quiz	5 pts
Oxidation Lab Report	40 pts
Calculations Assignment	40 pts
9 Pre-lab Exercises, 5 pts each	45 pts
9 Notebook pdf Submissions, 5 pts each	45 pts
Lab Notebook Evaluation	45 pts
Lab Exam 1, in-class	100 pts
Lab Exam 2, via Sakai	80 pts
	400 pts total

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

Lab Safety Quiz: This quiz is completed via Sakai and covers the lab rules that all students are expected to follow in order to maintain a safe working environment. It must be completed before the first experiment is performed.

Virtual Lab: To facilitate scheduling around the Martin Luther King Day holiday, the first experiment will be completed via Sakai. Students should watch the posted video and then complete the posted questions.

Calculations Assignment: This assignment covers the stoichiometry and other calculations pertaining to each experiment being performed in the course. It is programmed with unlimited attempts and must be completed before the Reduction experiment.

Pre-Lab Preparation: Success in organic lab depends on advance preparation. Therefore, there are several things students must do before coming to lab. One major component of the pre-lab assignment is to thoroughly read and understand the experimental procedure and any assigned background reading posted on Sakai. Additionally, before coming to class, students must watch the posted Safety and Setup video posted on Sakai. There are five questions embedded into each video that count as the pre-lab exercise for each experiment.

STUDENTS WHO DO NOT COMPLETE THE ONLINE SAFETY AND SETUP VIDEO AND 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. Before coming to class, students must complete the pre-lab portion of the lab notebook. The Instructor/TAs will be checking notebooks before each experiment. The lab notebook format is posted on Sakai. The pre-lab portion includes the Title, Objective, a complete Table of Reagents, a Balanced Chemical Equation, Pre-lab Calculations (i.e.; moles of each starting material and the Theoretical Yield), and an Outline. The Theoretical yield calculation must indicate the expected amount of product in grams for a solid product or milliliters for a liquid product.

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 the 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. In order to receive credit, the file must be legible, and it must be in the pdf format. Notebook Scan points will be awarded based on things such as accuracy, completeness of the data, identification of unknowns, etc. Notebook point deductions may also be made for safety violations, not participating in collecting the data, not finishing the experiment, etc.

Final Lab Notebook Evaluation: Notebooks will be collected on the last day of class and compared against the scanned notebook pages submitted on Sakai. Points up to and including full credit may be deducted if the actual notebook does not match the submitted files.

Lab Exams: There will be two exams. The first will be completed in class after the first 4 experiments (which includes the virtual-lab). The second exam will cover the remaining experiments and will be submitted via Sakai. Both exams will include material covered in class and posted on Sakai, background readings, as well as some prerequisite material. Be sure to bring a No. 2 pencil and Student ID to the in-class exam. Goggles and lab coats are not needed. The instructions for the second exam will be posted on Sakai. Points will be deducted for not following instructions.

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. Due to safety constraints and size limitations, students are not allowed to make up an experiment in another section. Missing a lab period will result in an automatic zero for the Notebook pdf Submission portion of that experiment. However, the Pre-lab Exercise can still be completed via Sakai. The normal due dates will still apply. There are no make-up points for missed pre-labs. Absent students are still responsible for all the material on exams. Students will be allowed to complete an alternate assignment for ONE absence from lab during the course, but they are responsible for requesting it from the instructor within a week of the absence. Any additional missed work beyond one experiment cannot be made up. Missing more than 2 experiments will result in automatic failure of the course.

There will be an attendance sheet that students are required to sign upon entering the lab. It is critical that the attendance sheet exactly match 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.) be sure to log out on the attendance sheet. For safety's sake, in order to better results and to be fair to both lab partners, limit time out of the lab. Students who leave the lab for a period longer than 10 minutes will receive a deduction from the Notebook Submission points for that experiment.

To ensure fairness to everyone, students who arrive late may be asked to perform an experiment solo.

Safety Rules: Read the safety rules carefully and follow them throughout the course. Anyone who does not adhere to the safety rules will receive point deductions and may not be allowed to remain in the laboratory. A pair of safety goggles will be provided at the beginning of the course. Eye protection and a lab coat must be brought to every experiment, as well as appropriate clothing and footwear (see the Safety rules). Any student lacking safety goggles, a lab coat, or not dressed according to the safety rules will be dismissed from that experiment and will receive a zero for the missed work.

Academic Integrity: Each student is expected to do independent work. All work submitted for a grade must be an individual effort. 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/>. Any instances of dishonesty (which include, but are not limited to, cheating, plagiarism, copying another student's work, and submitting false data) 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.

Hard Deadline: All materials of any kind must be submitted by 6 PM on April 24, 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.

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.

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: If you have any 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/>.

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/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.

Contacts: Dr. Eisenberg, FH-104, (773) 508-8714, jeisenberg2@luc.edu
Mr. Thomas, LSB 124, (773) 508-8115, tthoma1@luc.edu

Experiments

1. Potassium Permanganate Oxidation of Benzyl Alcohol
2. Sodium Borohydride Reduction of Benzophenone
3. Diels-Alder Reaction of Anthracene and Maleic Anhydride
4. Nitration of *N*-Acetyl-*p*-Toluidine
5. Ketone Unknowns
6. Structural Effects on Acidity
7. Fischer Esterification
8. Acylation of an Aromatic Amine
9. Polymers
10. Aldol Condensation of Vanillin and Acetone