

Description: A one-semester-hour laboratory course designed to accompany organic chemistry lecture.

Pre- and Co-requisites: Grade of 'C-' or better in 1 year of General Chemistry Lecture and Lab and Chem 223

Materials: Making the Connections<sup>3</sup> By Anne B. Padias (ISBN: 978-0-7380-7436-8)  
Permanently-Bound Composition Notebook  
Full-length lab coat  
Safety goggles (will be provided during safety training)  
Duplicate-page notebook for the Synthesis Experiments starting the last week of October

Course Homepage: Announcements, assessments, extra copies of the handouts, the grade book, etc. are posted on [Sakai.luc.edu](http://Sakai.luc.edu). You are responsible for this material, so you should check Sakai frequently.

Grading: Course grades consist of the following components:

Information Resources Assignment	10 pts
Best 8 of 9 Pre-lab Exercises, 10 pts each	80 pts
Best 8 of 9 Data Collections, 10 pts each	80 pts
Best 8 of 9 Post-lab Exercises, 15 pts each	120 pts
Formal Lab Report	50 pts
Synthesis Notebook Evaluation	10 pts
Quiz 1	100 pts
Quiz 2	<u>100 pts</u>
	550 pts total

A>94%, A->90%, B+>88%, B>84%, B->80%, C+>78%, C>74%, C->70, D+>68%, D≥60%, F<60%

Information Resources Assignment: This assignment is completed via Sakai in order to familiarize you with the Merck Index and other reliable resources to consult for finding physical property data on organic chemicals.

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. Students are encouraged to have some pre-lab sections prepared in their lab notebooks based on this information. Additionally, before coming to class, a pre-lab exercise must be completed via Sakai. Some of the pre-lab questions will 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 by Sakai.

Data Collections: During lab, students are strongly encouraged to record their results in a laboratory notebook. A properly-maintained notebook keeps all of your results in one place and will facilitate the completion of the post-lab exercises. The exact format of the notebook is up to the student for the technique experiments. However, a more formal lab notebook is required for the two synthesis experiments—substitution and elimination. The format of the formal lab notebook is described in the text and in a handout posted on Sakai.

To obtain the Data Collection points for each experiment, students must show their lab notebooks to their Teaching Assistant before leaving lab. The TA will sign the lab notebooks and keep a record of everyone's results for each experiment. If a student does not report results before leaving the lab, the results 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. When applicable, 2.5 points of the Data Collection score will count towards correctly identifying an assigned unknown compound. Data Collection point deductions will also be made for safety violations, late arrival, not participating in lab, not finishing the experiment, etc.

Post-lab Exercises: Short questions pertaining to the experiment just completed will be posted on Sakai. These should be completed after lab ends and are due at the beginning of the next lab period. Students are allowed one attempt until the due date, and assessments must be submitted to count. Work that is saved but not submitted before the deadline will be treated as a late, same-day submission. Spelling, grammar and significant figures count.

In-Class Quizzes: The first quiz will be completed after the first five experiments. The second quiz will cover the last three experiments and stoichiometry. Students must bring a No. 2 pencil and a Student ID. Goggles and lab coat are not needed. The quizzes will include material covered in class, the background readings, as well as co-requisite and pre-requisite material. Points will be deducted for not following instructions.

Formal Lab Report: A formal, type-written lab report over the Elimination experiment will be due according to the due date posted on Sakai. This report should be clearly written using proper scientific grammar (do not use first person tense like "I did this" or "we saw this"). More detailed guidelines for the report will be discussed in class and posted on Sakai.

Lab Notebooks: While the particular style and type of notebook can vary from student-to-student for the technique labs, there are some specific guidelines for documenting synthesis experiments in a lab notebook that are posted on Sakai. To ensure that students are properly setting up their notebooks for synthesis labs (which will be a major focus in CHEM 226, the next course in the sequence), students must obtain a duplicate-page notebook for those experiments. This notebook can also be used for CHEM 226. The duplicate pages from the notebook will be submitted for grading twice for each synthesis experiment. The pre-lab portion will be collected at the beginning of class. The rest of the notebook pages will be submitted at the end of lab.

Sakai Assignments: It is strongly encouraged that any assignment submission to Sakai be done on a computer with a reliable, wired internet connection (i.e., not wireless). Using devices such as cell phones and tablets with home/work/public wireless internet is not recommended. The University provides student access to Internet-wired computers in the Information Commons and various computer labs on the Lake Shore Campus. Under NO circumstances will excuses of "technical difficulties" be accepted for an incomplete assignment.

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 Data Collection portion of that experiment. However, the Pre-lab Exercise and Post-lab Exercise can still be completed via Sakai. The normal due dates will still apply, and absent students are responsible for all of the material on quizzes. The lowest score in each of the Pre-lab and Data Collection categories will be dropped from final grade calculations at the end of the semester. 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 Data Collection points for that experiment.

Additionally, students must be signed in prior to the start of the pre-lab lecture to ensure everyone's on-time arrival to class. Tardiness or just not signing in will result in a point deduction from the Data Collection points for that experiment. Students must be present for the pre-lab lecture because important safety-related information is covered. Any student who misses a significant portion of the pre-lab lecture will not be allowed to perform the experiment and will receive a zero for the Data Collection points for that experiment. Safely working with chemicals requires undivided attention! As such, any behavior that indicates that a student is not paying attention during the pre-lab will result in the student not being allowed to perform the experiment. This includes, but is not limited to, sleeping, looking at one's phone or computer, talking, etc.

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 particular experiment and receive a zero for the Data Collection points. No items will be loaned out. Students will not be allowed to miss lab time to obtain forgotten items.

Academic Integrity: Each student is expected to do independent work. Although the lab is constructed so students may work in pairs during an experiment, all work submitted for a grade must be an individual effort—especially the formal lab report! The penalty for academic dishonesty is a zero on the assignment and a letter grade reduction of the final course grade. TurnItIn.com will be used to scan student submissions.

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: 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: All emails to TAs or instructors should come from a Loyola email address. Emails from outside sources are often blocked automatically. In the subject line of an email, please indicate Chem 225 - lab section number and TA's name.

Course/Instructor Evaluation – IDEA: Loyola has the IDEA program for instructor and course evaluations. At the end of the semester, students will complete an online evaluation of this course based on criteria set by IDEA and by the instructor. For this lab course, the main objective is learning to apply course material to improve thinking, problem solving, and decisions. Other important objectives include gaining a basic understanding of the subject and developing specific skills needed by professionals in the field of organic chemistry. By the end of this course, students should be able to characterize organic compounds by measuring their physical properties, isolate organic compounds using a variety of purification techniques and, lastly, to synthesize organic compounds using chemical reactions. Keep these objectives in mind throughout the course.

Statement from the Chemistry Department Regarding the Co-Requisite Chem 223 Lecture Course: Students wanting to drop lecture after midterm may stay in the co-req lab only if the lecture midterm grade, posted in LOCUS, is a D or better. Students should continue to attend lecture until the week of the drop date to gain as much background knowledge as possible. For Fall 2017, students wishing to drop lecture, and who have a mid-term grade of D or better, can seek assistance from the Department of Chemistry and Biochemistry office beginning Monday 10/30 at 9:00am through Friday 11/3 at 4:00pm. Students with a midterm grade of F must drop the co-req lab along with the lecture. No exceptions.

Statement from the Chemistry Department Regarding Repeating a Course: 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 obtain a signature from 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.

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Mr. Thomas, LSB 124, (773) 508-8115, [tthoma1@luc.edu](mailto:tthoma1@luc.edu)

Experiments

1. Functional Group Identification
2. Boiling Points & Distillation
3. Melting Points & Crystallization
4. Extraction
5.  $^{13}\text{C}$  NMR Spectroscopy
6. Thin-Layer Chromatography
7. Synthesis: Substitution
8. Synthesis: Elimination
9. Natural Product Extraction