

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

Pre-requisites: CHEM 223/225

Co-requisite: CHEM 224

Materials: Making the Connections<sup>3</sup> by Anne B. Padias (ISBN: 978-0738074368)  
Permanently-Bound, Duplicate-Page Notebook (ISBN: 978-1930882003 for example)  
Full-length lab coat  
Safety goggles (will be provided during safety training)

Course Homepage: Announcements, assessments, 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:

Lab Safety Quiz	7 pts
Calculations Assignment	45 pts
9 Pre-lab Exercises, 5 pts each	45 pts
9 Data Collection and Analysis, 12 pts each	108 pts
Lab Exam #1 (In-class)	100 pts
Lab Exam #2 (via Sakai)	50 pts
Overall Notebook Evaluation	<u>45 pts</u>
	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 important lab rules that all students are expected to follow in order to maintain a safe working environment.

Calculations Assignment: This assignment covers the stoichiometry and calculations for each experiment.

Pre-Lab Preparation: Success in organic lab depends on advance preparation. Therefore, there are several things that must be done before coming to lab. One major component of pre-lab preparation is to thoroughly read and understand the experimental procedure posted on Sakai. If there are techniques mentioned in the procedure that one does not recall from first semester organic chemistry lab, the student should consult the technique readings in the Padias text as necessary.

Before coming to lab, students must also complete the pre-lab exercise via Sakai. Students are allowed unlimited attempts until the due date, and assessments must be submitted to count. Work that is saved but not submitted before the deadline will be ignored. Spelling, grammar and significant figures count.

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

Notebooks: The ability to keep good records is a valuable skill. Before coming to class, the pre-lab portion of the lab notebook must be completed. The Instructor/TAs will be checking notebooks before each experiment. Anyone who has not completed the pre-lab portion of the notebook will not be allowed to perform the experiment. The lab notebook format is posted on Sakai and there is also a description of how to complete a lab notebook in the Padias text. 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. The remaining portions of the lab notebook are filled out as the experimental work is completed.

Data Collection and Analysis: At the end of each experiment, each student must show the final product to the Teaching Assistant. Failure to do so will result in the loss of points. The quantity and quality of your product will be recorded and evaluated. Point deductions may be made for low yields and/or impure products. Point deductions may also be made for safety violations, late arrival, not participating in lab, not finishing the experiment, not participating in collecting the data, borrowing safety items, etc. Finally, before leaving lab, students must submit the duplicate pages from their lab notebooks. The lab notebook pages will be initialed by the Instructor/TA and stored for use by the student during the in-class exam. Only materials pertaining to the current experiment can be submitted.

Exams: The first exam is in-class and will cover the first five experiments and lab calculations. Be sure to bring a No. 2 pencil and a Student ID. A lab coat, goggles and a calculator are not required. The second exam is via Sakai and will cover the remaining experiments. In general, exams will cover material discussed in class, the background readings, as well as co-requisite and pre-requisite material. Points will be deducted for not following instructions. During exams, each student will be provided with a simple calculator, a periodic table, and the notebook pages submitted at the end of each experiment.

Notebook Evaluation: At the end of the term, each student's lab notebook will be evaluated for completeness and following the proper formatting guidelines.

Re-grades: All requests to have items re-graded must be submitted in writing to the Instructor 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 will not be allowed to make up an experiment in another section. Missing a lab period will result in an automatic score of zero for the Data Collection and Analysis points. However, students have the opportunity to earn the points back for one absence, no questions asked. Absent students will be provided with one out-of-lab exercise to make up the Data Collection and Analysis points. The make-up exercises will vary depending on the experiment, and students should contact their instructor for the assignment. Make-up assignments must be handed in within one week of the absence to earn the points. Please note that the normal Sakai due dates for the pre-lab exercises will still apply, and students are responsible for all of the material on the lab exams. 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 a student 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 lab partners, limit any 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 and Analysis points for that experiment. Students must be present for the pre-lab lecture because important safety-related information is covered. Any student who misses the pre-lab lecture will not be allowed to perform the experiment and will receive a zero for the Data Collection and Analysis points for that experiment. Safely working with chemicals requires undivided attention! As such, any behavior that indicates 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. Students must bring your eye protection and lab coat with you to every experiment, as well as dress in appropriate clothing and footwear. One time during the semester, a student may borrow goggles and/or a lab coat. There will be a deduction from the Data Collection and Analysis points for each item. These items cannot be borrowed more than once per semester.

Academic Integrity: Each student is expected to do her/his own 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. The penalty for academic dishonesty is a grade of 'F' for the course.

Late Policy: Unless otherwise specified, materials that are submitted late but on the same day 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 and an outside contractor also scans faculty email. 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. Emails from outside sources are often blocked automatically. In the subject line of an email, put Chem 226- section number and TAs name.

Course/Instructor Evaluation – IDEA: Loyola has the IDEA program for instructor and course evaluations. At the end of the semester, students can 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. 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.

Interactions with TAs: In order to increase the amount of individual assistance each student receives in lab, Teaching Assistants will participate in delivering this course. If at any time during the semester, any questions or concerns arise about the behavior of the Teaching Assistant, please contact the Instructor.

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### Experiments

1. Reduction
2. Diels-Alder
3. Nitration
4. Ketone Derivatives
5. Esterification
6. Oxidation
7. Aldol
8. Acylation
9. Polymers