

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

Pre- and Co-requisites: Grade of 'C-' or better Chem 223 and Chem 225; Chem 224.

Materials: Making the Connections³ By Anne B. Padias_(ISBN: 978-0-7380-7436-8)
Permanently-Bound Composition Notebook

Safety goggles are provided during safety training and must be brought to every lab. A full-length lab coat is also required.

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

Grading: Course grades consist of the following components:

Online Safety Training	5 pts
Best 10 of 11 Pre-lab Exercises, 5 pts each	50 pts
Best 10 of 11 Pre-lab Notebook Preparations, 5 pts each	50 pts
Best 10 of 11 Products, 10 pts each	100 pts
Best 9 of 10 Post-lab Exercises, 20 pts each	180 pts
Notebook Evaluation	45 pts
Chemistry Literature Searching Exercise	<u>20 pts</u>
	450 pts total

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

Online Safety Training: All students must watch the presentation posted on Sakai and score 5/5 on the Safety Training Quiz before being allowed to work in the laboratory. There are unlimited attempts.

Pre-Lab Preparation: Success in organic lab depends on advance preparation. Therefore, there are several things you must do before coming to lab. One major component of your pre-lab assignment is to thoroughly read and understand the experimental procedure and the assigned background readings listed on Sakai.

Before coming to class, you must complete the pre-lab 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 rejected. Spelling, grammar, and significant figures count. It is highly recommended that you check the Sakai gradebook to ensure the score was successfully recorded before coming to class.

Lab Notebooks: Before coming to class, you must also complete the pre-lab portion of your lab notebook, scan it and submit it via Sakai using the Assignments tab. We recommend using an app on your phone, a flatbed scanner, or a photocopier to do this. This assignment must be submitted in the pdf format before the lab starts to receive credit. 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, Table of Reagents, Balanced Chemical Equation, Pre-lab Calculations (i.e.; moles of each starting material and the Theoretical Yield), and an Outline. The remaining portions of the lab notebook for each experiment are to be completed in class. The ability to keep good records is a valuable skill and keeping an organized lab notebook will facilitate completion of the post-labs. The entire notebook will be physically collected for grading at the end of the last experiment.

Data Collection: At the end of each experiment and before you leave lab, you must report your experimental data to your Teaching Assistant. The TA will record your results for each experiment. If you do not report your results before leaving lab, you can email your data to your 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. The lowest Data Collection score will be dropped. For synthesis labs, if you do not submit your product to your TA before placing it in the waste jar, you will not receive the Data Collection points.

One of the most important facets of experimental work is that the data should be recorded as completely and accurately as possible. Sometimes, important discoveries are made when things don't behave "as they should". Therefore, it is critical that you report your actual data and not what you think the correct answer should be. Students who complete the entire experiment in good faith will receive all of the Data Collection points. You do not have to worry about your data being "right". Data Collection point deductions will be for safety violations, not finishing the experiment, etc.

Post-lab Exercises: Short questions pertaining to the experiment you have 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. Three attempts are allowed. Students may save their work and return to it, but the Post-lab exercises must be submitted to count. Work that is saved but not submitted before the deadline will receive a 20% deduction. Spelling, grammar and significant figures count. There is no post-lab for the Aldol experiment.

Chemistry Literature Searching Exercise: Organic chemistry is a vibrant, living science that is perpetually changing and building upon itself. There are new compounds and new reactions constantly being discovered. These advancements are normally published in journal articles and conference proceedings. This is sometimes called the primary literature. In this exercise, which is completed via Sakai, you will learn about some tools for navigating the vast amount of information in the chemistry-related primary literature. Three attempts are allowed. Students may save their work and return to it, but the exercise must be submitted to count. Work that is saved but not submitted before the deadline will receive a 20% deduction.

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: You are expected to attend every lab session. Due to safety constraints and size limitations, you will not be allowed to make up an experiment in another section. Missing a lab period will result in a zero for the Data Collection portion of that experiment. However, you may still complete the Pre-lab Exercise and Data Analysis portion for that experiment. The normal due dates will still apply. Also, remember that there is a drop policy for the Pre-lab exercises, Data Collections, and Data Analyses. Missing more than 2 experiments will result in automatic failure of the course. If you are concerned about recording the content of the experiment in your laboratory notebook, contact the instructor.

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 you must leave the lab after signing in (e.g.; to use the restroom, get a drink of water, etc.) be sure to log your exit on the attendance sheet. For safety's sake, in order to better results and to be fair to your lab partner, limit your 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, you 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, which cannot be made up.

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. You will be provided a pair of safety goggles at the beginning of the course. You must bring your eye protection and lab coat with you to every class, as well as dress in appropriate clothing and footwear. One time during the semester, a student may borrow goggles, a lab coat or socks. There will be a deduction from the Data Collection 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: You must use your Loyola email address when contacting the TAs or the instructor for this course. Emails from outside sources are often blocked automatically. In the subject line of your email, put Chem 226-section number and TAs name.

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Experiments

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