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

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

Materials: Making the Connections[3] By Anne B. Padias (ISBN: 978-0-7380-7436-8)
Full-length lab coat
Safety goggles (will be provided during safety training)

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
Virtual Lab	40 pts
Calculations Assignment	40 pts
9 Pre-lab Exercises, 5 pts each	45 pts
9 Data Collections, 10 pts each	90 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 important 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 Independence 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 can be done at any point during the course.

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 postedon 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 to verify they are aware of the highlights pertaining to the experiment. In order to gain access to the pre-lab exercises, students must first watch the pre-lab videos pertaining to the safety and setup of the experiment. Students are allowed unlimited attempts on the pre-labs 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. No late pre-labs will be accepted.

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

Data Collections: At the end of each experiment and before leaving lab, all students must report their experimental data to the Teaching Assistant in order to obtain the Data Collection points. The TA will record the results for each experiment and collect any relevant graphs, spectra, etc. If results are not reported or

items are not handed in before leaving the lab, the data 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.

Students are strongly encouraged to record their results in a laboratory notebook. A properly-maintained notebook keeps all of the experimental results in one place. The format of the notebook is described in the Padias text and in a handout posted on Sakai. 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 automatically receive half of the Data Collection points. The remainder of the points will be awarded based on things such as accuracy, completeness of the data, identification of unknowns, etc. Data Collection and Analysis point deductions will also be made for safety violations, not participating in collecting the data, not finishing the experiment, etc.

Lab Exams: There will be two exams. The first will be completed in class after the first 5 experiments (which includes the virtual lab). The second exam will cover experiments 6-9 and will be submitted via Sakai. Both exams will include material covered in class and posted on Sakai, background readings, as well as some pre-requisite 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.

Grading: In order to facilitate fair and systematic grading of student work by the TAs, the identities of students are hidden from the TAs during grading.

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 Data Collection 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 of the material on quizzes. Students will be allowed to perform an alternate assignment/experiment for ONE absence from lab during the course, but they are responsible for requesting it from the instructor within a week of the absence. 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. 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. 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 5 PM on August 9, 2019. 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 –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.

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.

Students with Disabilities: If a student has any special needs, please let the instructor 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, 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: 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 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

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Experiments

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