

Organic Chemistry I with Lab for Chemistry Majors, CHEM 221, Fall 2018

Dr. Daniel Becker, Ph.D., Flanner Hall 217A, email: dbecke3@luc.edu
<http://www.luc.edu/chemistry/facultystaff/beckerdaniel.shtml>

Lecture	MWF	2:45 – 3:35 PM	Cuneo 109	(CHEM 221-001-1061)
Discussion I	Tue	11:30-12:20 PM	Dumbach 119	(CHEM 221-002-1063)
Discussion I	Tue	1:00-1:50 PM	Dumbach 119	(CHEM 221-003-3441)
Lab section I	Tue	2:30-5:15 PM	LSB 115	(CHEM 221-004-3442)
Lab section II	Thur	2:30-5:15 PM	LSB 115	(CHEM 221-005-3443)

Office Hours: Mondays & Wednesdays 3:45-4:45 (right after lecture) in my office, FH-217A
Suppl. Instr.: Elliot Gild, Supplemental Instructor (SI), egild@luc.edu

Required Text: Organic Chemistry, Klein, 3rd edition, hard copy or eText
Required Key: Student Study Guide and Solutions Manual for Organic Chemistry, Klein 3rd
Optional Online: WileyPlus online (can be purchased separately)
Prerequisites: CHEM 102 (Gen Chem B) & CHEM 112 (Gen Chem B Lab), or CHEM 106.

Laboratory: The course lab portion is under the direction of Mr. Tim Thomas, MS, MLIS.
Required Lab Text: “Making the Connections 3” (3rd Ed.) by Anne B. Padias (ISBN: 978-0-7380-7436-8)
or the 2nd Ed. (ISBN: 978-073804135-3)
Required Lab Book: Laboratory Notebook: Hayden-McNeil (ISBN: 978-1930882744).
Note: The Padias text and combined notebook will be good for both semesters.

Required: Your favorite organic molecular model kit from wherever. Here are just a few of options: Duluth Labs MM-005 Student Set, *or* Darling Molecular Modeling Kit, *or* Prentice Hall Molecular Model Set

Extra Resources *Organic Chemistry as a 2nd Language I* (1st semester topics), David R. Klein
Organic Chemistry as a 2nd Language II (2nd semester topics), David R. Klein
Pushing Electrons by Daniel Weeks a workbook for extra help with *mechanisms*

CHEM 221 Course Description

For Chemistry Majors, CHEM 221 is a 4 credit hour lecture, discussion and laboratory course covering nomenclature, properties, reactions & synthesis, stereochemistry, and mechanisms plus IR and mass spectrometry of organic molecules including alkanes, alkyl halides, alkenes, alkynes, and alcohols.

Outcome: Assign and understand IUPAC names, predict reaction products and mechanisms, supply starting materials and reagents for synthetic conversions, interpret as well as predict spectra (MS, IR) for organic molecules, and learn techniques for executing organic reactions in the laboratory.

Why Orgo? Do you have an interest in human health, prescription medicines and drugs? Organic chemistry is utilized by medicinal organic chemists for the design and construction of new molecules (drugs!) that are prescribed by doctors and dispensed by pharmacists to treat diseases. Organic chemistry is also essential for inventing new dyes, plastics, resins, and detergents, and it is also used in creating new photoreceptors for renewable solar energy and LEDs for display panels (organic LEDs = OLEDs).

1. *Syllabus:* The current syllabus is posted on Sakai and is subject to change (dated at the top) during the semester. *You are responsible for all changes announced whether or not you are in attendance.*

2. *Exams and Grading:* There are three mid-term exams and one 2-hour final exam.

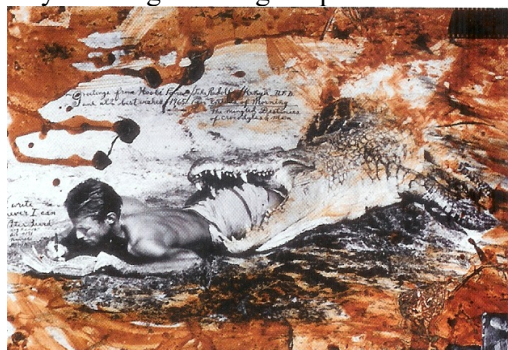
Mid-term exam I	20%	Laboratory work & exams	20%
Mid-term exam II	20%	<u>Final Exam</u>	<u>20%</u>
Mid-term exam III	20%	Total	100%

This grading standard will be applied: 90% A, 87% B+, 83% B, 80% B-, 77% C+, 73% C, 70% C-, 65% D, 60% D-, <60% F. A curve for each individual exam may be applied based on the specific average and standard deviation, and will be provided upon return of the exam, along with exam grade distribution statistics.

You must bring a form of photo identification to the exam, and please place your ID face up at the front edge of your desk during the exam. All exams are closed book and closed notes. When you are finished, please bring your completed exam to the front, and leave the room quietly without disturbing the other students. Each exam will be provided a tear-off cover sheet including the Periodic Chart of the Elements and possibly other reference items, such as a table of bond dissociation enthalpies. You may leave the tear-off sheet in a separate pile from the exams and I will recycle them, or you are free to keep your tear-off sheet. Show your work on your exam (not on the tear-off sheet), which will be considered in assigning credit in the short and long answer portions.

There are no make-up exams. If you miss an exam for any reason, the final exam will be weighted more heavily to compensate for the missed exam. Exams will be graded and returned as quickly as possible, usually by the following class period. All grading questions, points of clarification, and grading errors must be brought to the instructor's attention within one week after the graded exam is returned.

3. *Homework:* Organic chemistry is a new language that is spoken in structures. The best way to learn a language is to practice speaking and writing it, so the best way to learn organic is to work problems every day. Homework problems will be recommended for each chapter but not collected, so you must be disciplined about working problems and keeping up with the pace of the lecture. Experience has demonstrated a direct correlation of success in organic with consistently working the assigned problems in the book and writing out the answers.



Never miss an opportunity to work some organic chemistry problems.

4. *Discussion:* The discussion section will be devoted to working through problems and answering questions about the homework problems and lecture/text material. *Attendance and participation are expected.*

5. *Sakai Materials:* All handouts provided in class will be mirrored on Sakai.

6. *Academic Honesty:* First off, let me say that I grade all exams individually and personally, and I pay especially close attention to written answers in order to check your understanding and to assign appropriate credit for work demonstrate. I grade each page in order (i.e., I grade page 1 on all exams, then page 2 on all exams, etc.) to ensure that partial credit is awarded consistently and fairly. Thus, it is very obvious to me when two exams have identical written answers. Therefore, resist the temptation to ever let your eyes drift during an exam, first of all because copying is cheating, and secondly, because I am very good at detecting duplicate answers. Also, please be mindful of your own exam by not providing an attractive nuisance for wandering eyes of other potentially weak-willed individuals. All exams are closed book and closed note. Academic dishonesty includes using notes or books during exams, looking at another student's test during the exam period, or talking

during an exam. The consequence of academic dishonesty is failure of the exam, and the incident will be reported to the Chemistry Department Chair and the Office of the Dean. Additional sanctions including expulsion from the University may be imposed. Anything you submit that is incorporated as part of your grade in this course (quiz, exam, lab report, etc.) must represent your own work. Any student caught cheating will, at the very minimum, receive a grade of F for the item that was submitted. Cheating on any lab material results in zero points for the lab portion of the course. All students in this course are expected to have read and to abide by the appropriate standard of personal honesty and integrity, drafted by the College of Arts & Sciences that can be viewed online at <https://www.luc.edu/cas/advising/academicintegritystatement/>

7. *Strategies and Suggestions:*

- The best method of learning organic chemistry is to work the assigned problems and write out the answers. *Then* check your answers versus the Solutions Manual (SG/SM).
- Study at least 12 hours per week and maintain a steady pace of studying. Organic chemistry continually builds, like a language, so studying every day is most effective.
- Homework will not be collected, but it is essential to work problems in a timely fashion.
- Skim the current chapter before the lecture, so that you will be aware of the topics to be covered.

8. *Supplemental Instruction (SI) and Tutoring*

There are Supplemental Instruction (SI) study sessions available for this course. SI sessions are led by an SI leader, who is a student that has recently excelled in the course. Session attendance is open to all and is voluntary, but extremely beneficial for those who attend weekly. Times and locations for the SI session can be found here: www.luc.edu/tutoring. Students who attend these interactive sessions find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Research shows students whom regularly attend sessions have higher grades at the end-of-the-semester and more deeply understand course concepts than those who do not. Students are asked to attend SI sessions with their Loyola ID, lecture notes, and textbook.

The Tutoring Center offers free small group tutoring and lab (drop-in) tutoring for Loyola students. The groups meet once a week through the end of the semester and are led by a student who has successfully completed study in the course material. To learn more or request tutoring services, visit the Tutoring Center online at www.luc.edu/tutoring. The Student ACS (American Chemical Society) affiliate also offers tutoring for free every week in Flanner Hall.

9. CAS has accommodations for students with disabilities (SSWD), including a testing center in the Sullivan Center. For more information see <http://www.luc.edu/sswd/>.

10. 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.

10. 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 (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/athletheadvising/attendance.shtml>)

Organic Chemistry 221 Tentative Schedule (subject to change)

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	8/26 Ch 1: Gen Chem Review	8/27	8/28 ...Ch 1...	8/29	8/30 Ch 2: Molecular Representations
2	9/2 Labor Day No class	9/3	9/4 ...Ch 2...	9/5	9/6 ...Ch 2...
3	9/9 Ch 3: Acids & Bases	9/10	9/11 ...Ch 3...	9/12	9/13 Ch 4: Alkanes & Cycloalkanes
4	9/16 ...Ch 4...	9/17	9/18 Ch 5: Stereoisomerism	9/19	9/20 Midterm I over Ch 1-4
5	9/23 ...Ch 5...	9/24	9/25 ...Ch 5...	9/26	9/28 Ch 6: Reactivity & Mechanisms
6	9/30 ...Ch 6...	10/1	10/2 ...Ch 6...	10/3	10/4 ...Ch 6...
7	10/7 Midsemester Break – no class	10/8 Midsemester Break – no lab	10/9 Ch 7: Subst/Elim Alkyl Halides	10/10	10/11 ...Ch 7...
8	10/14 ...Ch 7...	10/15	10/16 Ch 8: Alkene Additions	10/17	10/18 Midterm II over Ch 1-7
9	10/21 ...Ch 8...	10/22	10/23 ...Ch 8...	10/24	10/25 ...Ch 8...
10	10/28 Ch 9: Alkynes	10/29	10/30 ...Ch 9...	10/31	11/1 ...Ch 9...
11	11/4 Ch 10: Radical Reactions	11/5	11/6 ...Ch 10...	11/7	11/8 Ch 11: Synthesis
12	11/11 ...Ch 11...	11/12	11/13 Ch 12: Alcohols & Phenols	11/14	11/15 Midterm III over Ch 1-11
13	11/18 ...Ch 12...	11/19	11/20 ...Ch 12...	11/21	11/22 Ch 13: Ether & Epoxides & Sulfur
14	11/25 ...Ch 13...	11/26	11/27 Thanksgiving No class	11/28 Thanksgiving No class	11/29 Thanksgiving No class
15	12/2 Ch 14: IR & MS	12/3	12/4 ...Ch 14...	12/5	12/6 ...Ch 14...
16	12/9	12/10	12/12 Study Day	12/12	12/13 Cuneo 109 4:15 p.m. Final Exam Cumulative Ch 1-14