

Loyola University Chicago

Syllabus Organic Chemistry II CHM 224 Sec. 001; Monday, January 17 - Friday, April 29 SPRING 2022

The purpose of this syllabus is to describe the course, resources, and policies. It is meant help all students understand the expectations and requirements for the course, and it should be used as a reference when questions about policy arise during the semester. When updates to the syllabus are made during the semester, a new version will be posted electronically, and all students will be notified. By design, some policies are incomplete in the first version of the syllabus and must be updated. Additional changes will be made if and when it becomes necessary for the entire class. Time Zone: This syllabus lists dates/times using Chicago local time (U.S. Central Time Zone) Online classes via Zoom: login to Sakai to access the Zoom tool within our course site, must be authenticated to join In-person classes: Lectures are scheduled for Flanner Auditorium/133, Discussions in Flanner 105, starting Jan. 31st; The first two weeks of the term are conducted through ZOOM meetings, for both lectures and discussions. Log into SAKAI and go to ZOOM; click on the specific date. Each individual discussion has its own ZOOM scheduled meeting. **Lecture: M, W 04:15 PM - 05:30 PM; FLANNER HALL 133; Prerequisite CHEM 223 or Equivalent**

Instructor: Donald May Contact: dmay4@luc.edu **Office: Flanner Hall 403: MONDAY: 01:30 PM – 02:30 PM**

Discussion: 002 W, 01:40 PM – 02:30 PM Flanner Hall 105; 003 W, 02:45 PM – 03:35 PM Flanner Hall 105

Required Materials: Textbook: ORGANIC CHEMISTRY by David Klein; 4th edition

Optional: - Student Study Guide and Solutions Manual,

- Molecular Model kit

As a possible study aid, you may want to consider purchasing, a paperback by D.R. Klein entitled “Organic Chemistry as a Second Language: Translating the Basic Concepts” (I&II); 2004 by John Wiley & Sons, Inc.; ISBN 0-471-27235-3; www.wiley.com/college/klein. These are to help the student develop the skills required to solve a variety of problems in organic chemistry and to point out the fundamental principles in organic chemistry. An additional study aid is a paperback by D.P. Weeks entitled “Pushing Electrons: A Guide for Students of Organic Chemistry,” Third Edition (Thomson Brooks/Cole); ISBN 0-03-020693-6. The first 3 chapters (pp. 1-161) of this workbook are intended to help a student understand “structure and bonding in organic molecules,” as well as techniques of “electron pushing” so as to comprehend reaction mechanisms.

Supplementary Textbooks: Organic Chemistry, Eighth Edition by Wade (Pearson; 2016)

Organic Chemistry, Tenth Edition, by T.W.G. Solomons and C. Fryhle (John Wiley & Sons, Inc., 2011).

Organic Chemistry, Eighth Edition, by J. McMurry (Brooks/Cole Publishing Co., 2012).

Organic Chemistry, by F.A.Carey and R.M. Giuliano, Eighth Edition (McGraw-Hill, Inc., 2011).

Organic Chemistry: Structure and Function, by K.P.C. Vollhardt and N.E. Schore, Sixth Edition (W.H. Freeman and Co., 2011).

Method of instruction: For the first two weeks, lectures and discussions will be presented synchronously using ZOOM. Starting January 31, 2022, both lecture and discussions will be conducted in-person. Lectures may be supplemented with classroom discussion, use of molecular models, use of multimedia, and/or use of computer based materials as well as individual and/or group problem solving. Suggested textbook problems typically will be given within 24-36 hours, from the initial introduction of new chapter material and are not graded. Students must attend the lecture/discussion to receive the handout. Discussion handouts must be completed: in regular #2 or HB pencil only, are expected to be neat and legible, free of scribbling/scribbled responses, incorporate correct chemical symbols (Review the Chemical Periodic Table of the Elements). Students are expected to attend the discussion on time; students must turn in their own discussion handout by the announced due date: only the original will be accepted; no late handouts will be accepted; no photocopies accepted; students must follow the directions on the handouts. Discussion handouts will contribute 10% toward the final grade: the lowest discussion handout score will be dropped: any single missed discussion handout will be the dropped score with any additional missed discussion handouts incorporated with a zero score. No make-up discussion handouts. The instructor reserves the right to modify any and all of the course requirements at any time.

Grading: Semester grades will be determined by the following criteria: discussion handouts at 10%, Three unit exams with the comprehensive final; Final grades will be determined from one of the following unit exam/ final exam contribution options, whichever is higher: No early and no make-up in-class exams; No late discussion handouts. For a single, missed in-class unit exam, Option #2 automatically will be utilized to determine the final course grade. Any subsequent missed in-class exams will be scored as zero. See attached schedule. Exams will incorporate all theory up to and including all lectures and discussions, prior to the exam. **Final course grade assigned:** A: 100% – 85.0% A- : 84.9% – 80.0% B+: 79.9% – 75.0% B: 74.9% – 70.0% B-: 69.9% – 65.0% C+: 64.9% – 60.0% C: 59.9% – 55.0% C-: 54.9% – 50.0% D+: 49.9% – 45.0% D: 44.9% – 40.0% F: < 40.0%

EXAM DATES: (Tentative: subject to change): EXAM I: Monday, February 14, 2022; EXAM II: Monday, March 21, 2022; EXAM III: Monday, April 18, 2022; FINAL EXAM (COMMON): WEDNESDAY MAY 04; Start time 07:00 PM

EXAM CONTRIBUTION OPTION 1: All three (3) unit exams at 20% each = 60% + final exam 30% = 90%

EXAM CONTRIBUTION OPTION 2: Best two (2) unit exams at 20% each = 40% + final exam 50% = 90%

OPTION #1: Discussion Handouts: 10%

3 Unit Exams@60% + Final Exam@30%

Total: 100%

OPTION #2: Discussion Handouts: 10%

2 Unit Exams@40% + Final Exam @50%

Total: 100%

No early and no make-up in-class exams; No late discussion handouts. For a single, missed in-class unit exam, Option #2 automatically will be utilized to determine the final course grade. Any subsequent missed in-class exams will be scored as zero. See attached schedule. Exams will incorporate all theory up to and including all lectures and discussions, prior to the exam. There are no early and no make-up unit exams. Students must bring and present their Loyola I.D. to each exam. Students are not allowed to leave during exams. If you leave, you must turn in your exam and you will be considered finished with the exam. If a student begins an exam it must be turned in for grading. Students must turn in all exam materials/pages when finished. Exam

copies cannot be taken from lecture: see Academic Integrity Violations. Graded exams will be returned as soon as possible. Issues with graded exams must be submitted within 5 days of being returned, otherwise scores will be considered final. Students must submit a signed statement requesting a review of the exam question, although the entire exam is now subject to being re-graded. Any single regrade will be considered the final score and no subsequent regrade request will be considered.

Student Conduct: Only students officially enrolled for the course may attend lecture and discussion. Students must attend only the discussion section for which they are officially enrolled. At all times students are expected to conduct themselves in a mature and professional manner, which includes but is not limited to: treating everyone in class with respect, avoidance of extraneous comments and small group discussions during lecture. Eating, chewing gum/tobacco products and drinking (food items) are not allowed. Students are expected to take care of their personal matters before discussions/ lectures/exams. Additionally radios, headphones, cell-phones or similar devices are not permitted during discussions/ lectures/exams. Not all contingencies can be listed but inappropriate conduct will be addressed. Disruptive students will be asked to leave. If a cell phone rings (beeps, buzz, etc.) during any exam, the exam will be collected and the student will not be allowed to continue. Exam questions, however, will come predominantly from lecture notes and concepts related to suggested homework problems. If a student begins an exam it must be turned in for grading. Students are not allowed to leave the room during exams until their exam is handed in for grading. If you leave, you must turn in your exam and you will be considered finished. Please keep noises and sounds to a minimum. When leaving, be respectful and leave quietly. During exams, only religious caps/ hats/hoods are allowed: nonreligious caps, hats, hoods, visors and so forth, will not be allowed to be worn during exams. All personal materials, besides pencils and erasers, will be placed at the front of the room, if available. Students will sit in every other seat during exams, if possible. Other specific instructions will also be given for exams. **Student Conduct: RETURNING TO CAMPUS:** Please be familiar with and adhere to all guidelines posted on the *On-Campus Guidelines in Classroom Scenarios of the Return to Campus* Guidelines site: (<https://www.luc.edu/returntocampus/classroomscenarios/>)

Masking Requirement: It is Departmental policy that, even in the event the University relaxes its universal requirement for indoor mask-wearing during the semester, it will remain a principle of this class-section that, out of respect for the health of housemates and others in regular contact with members of our community, in this class we properly wear masks at all times (e.g. over nose and mouth). **Online Class Specifics: The University may return to an on-line format, at any time during the term. Specific requirements will be indicated and the syllabus updated accordingly.**

Academic Integrity: Consult the Undergraduate Studies Handbook for additional information. 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/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf

Anything you submit that is incorporated as part of your grade in this course must represent your own work, unless indicated otherwise. All exams are closed book and closed note: No external materials or personnel are allowed. During exams, violations include but are not limited to: cell phone ringing, answering/using a cell phone, using unauthorized notes or books, looking at another student's exam, talking to other students, opening and/or utilizing anything in your book bag, and so forth. Any student found to be in violation or cheating will, at minimum, be given a zero for the assignment/exam and the incident will be reported to the Chemistry Department Chair and the Office of the CAS Dean. Option #1 will automatically apply and a zero for that exam will be recorded. Depending on the seriousness of the incident, additional sanctions may be imposed. Materials from the course cannot be shared outside the course without the instructor's written permission. Students may not be aware of copyright and intellectual property rights. Materials from the course cannot be shared outside the course without the instructor's written permission. Students may not be aware of copyright and intellectual property rights. Trust and integrity are important qualities in students. All submitted work must represent your own work and your own work only. Academic dishonesty of any kind, such as plagiarism and cheat sheets on exams, will not be tolerated. Any student caught cheating on an assignment in any way will receive at minimum a zero score or zero %, for that assignment and be reported to Chairperson of the Chemistry Department and the Dean of the School of Arts and Sciences. A zero on an exam for cheating will not allowed to be dropped and grading Option 1 will be utilized. For further information regarding the Academic Integrity policy and disciplinary procedures, refer to the Undergraduate Studies Catalog: http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml.

Academic Dishonesty also includes such infractions as:

- Obtaining a copy of tests or scoring devices
- Using another student's answers during an examination
- Providing another student questions or answers to or copies of examination questions
- Having another person impersonate the student to assist the student academically
- Impersonating another student to assist the student academically
- Representing as one's own work the product of someone else's creativity
- Using, or having available for use, notes or other unpermitted materials during "closed book" examinations
- Duplicating any portion of another student's homework, paper, project, laboratory report, take-home examination, electronic file or application for submission as accepting a copy of tests or scoring devices
- Having someone other than the student prepare any portion of the student's homework, paper, project, laboratory report, take-home examination, electronic file or application, other than for a teacher-approved collaborative effort.
- Permitting another student to copy any portion of another student's homework, paper, project, laboratory report, take-home examination, electronic file or application other than for a teacher-approved collaborative effort

- Using any portion of copyrighted or published material, including but not limited to electronic or print media, without crediting the source
- Any other action intended to obtain credit for work that is not one's own.

Course Practices Required: College-level writing skills on exams; communication skills for discussion and articulation of questions; completion of reading assignments and hand-outs. It is recommended that the student read through each chapter before lecture and eventually work through the suggested problems before the exams and graded discussions. Tutoring is available in the Sullivan Center; The ACS Loyola Chapter also provides tutoring, free of charge, on a walk-in basis, during the week in Flanner 129 (days/time announced); A few graduate students serve as private, one-to-one tutors but have individual rates of remuneration/monetary compensation for their services. Materials from the course cannot be shared outside the course without the instructor's written permission. Students may not be aware of copyright and intellectual property rights. Students engaged in official university off-campus activities will need to make proactive arrangement for missed course assignments, in providing the appropriate signed documentation in advance of the date missed. The actual pace may vary from this schedule: if you miss a class for any reason, it is your responsibility to work through the content, and I also suggest you contact a classmate for further discussion of the topics as you are still responsible for all material covered and assigned. I do not have published lecture notes. Slides/handouts/links/animations and other additional resources will be shared on Sakai. We may not cover every topic in every chapter of the textbook. Focus first on the material that is directly covered in lecture and assigned or recommended. Explore the additional material in the textbook for your own interest and enrichment.

Disability Accommodations: Students requiring accommodations at the University need to be proactive and contact the Coordinator of Services for Students with Disabilities. Accommodations are provided after receiving documentation from SACTesting and allowance of a reasonable time frame for arrangements (minimally, one week in advance). Accommodations cannot be retroactive. Contact: <http://www.luc.edu/sac/>

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 i.e., "Athletic Competition & Travel Letter" 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 to the professor in the first week of a semester. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to allow the student to take the examination at another time. (<https://www.luc.edu/athletheadvising/attendance.shtml>) Students who will miss class for an academic competition or conference must provide proper documentation to their instructor as early in the semester as possible.

Learning Objectives: Students who successfully complete this course will be able to do the following at an acceptable level: Name and draw complex organic structures; Predict both physical and chemical properties as well as identify and name, aromatics, phenols, aldehydes, ketones, carboxylic acids, derivatives of carboxylic acid, and amines; Describe and differentiate between various mechanisms, such as electrophilic versus nucleophilic aromatic substitution; Relate reaction mechanisms to intermediates, stereochemistry, and kinetics; predict reaction mechanism from experimentally related data and vice versa; Work with multi-step reaction pathways; develop synthetic pathways to simple organic compounds; Use NMR, IR, UV, and mass spectrometry data to identify structures; predict the spectroscopic data from the structure; Identify and describe biomolecules including carbohydrates, amino acids/proteins and heterocyclic/nucleotide/nucleic acids; Predict the structure and stereochemistry of various carbonyl and other condensation reactions.

Important Dates: Academic Calendar, www.luc.edu/academics/schedules

Monday, January 17: NO CLASSES: Holiday MLK BIRTHDAY **Monday, February 14: Summer 2022 Registration**
Monday - Friday, March 07 - 011: SPRING BREAK: NO CLASSES **Monday, March 28: Last day for "W" withdrawal otherwise "WF"** **Monday, April 04: Fall 2022 Registration** **Thursday-Friday, April 14-18: No classes after 04:15 PM on Thursday: Easter Holiday; Monday April 18: Classes starting on or after 04:00 PM are held**

Academic Calendar, www.luc.edu/academics/schedules Students wanting to drop lecture after midterm may stay in the co-req lab only if lecture midterm grade, posted in LOUCS, is a D or better. Students should continue to attend the lecture until the week of the drop date to gain as much background knowledge as possible. For students wishing to drop lecture, and have a mid-term grade of D or better (in lecture), can seek assistance from the Department of Chemistry & Biochemistry office. Students with a midterm grade of F must drop the co-req lab along with the lecture. No exceptions. **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 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.

EXAM DATES: There are no early tests/exams given, and no make-ups. The Final Exam is scheduled by the University. Excused absences require documentation of an unforeseeable emergency but do not result in a make-up testing because a single, missed midterm exam is automatically dropped: See grading options above.. Our grading system is designed to allow for circumstances that require you to be absent (e.g., illness). (Tentative: subject to change): EXAM I: Monday, February 14, 2022; EXAM II: Monday, March 21, 2022; EXAM III: Monday, April 18, 2022; FINAL EXAM: Wednesday, MAY 04, start time: 07:00 PM. The University sets the schedule for all final exams, and has updated the schedule for Spring 2022. The final will be held on: Wednesday May 4th, 7:00pm. This time is common to all sections of CHEM 224 and other Chemistry courses. There will be no make-up final exams given under any circumstance, and the exam will not be given early, either. Instructors may not reschedule final exams for a class for another day and/or time during the final exam period. There can be no divergence from the posted schedule of dates for final exams. Individual students who have four (4) final examinations scheduled for the same date may request to have one of those exams rescheduled. If a student reports having four final examinations scheduled for the same date, students should be directed to e-mail a petition to Adam Patricoski, Assistant Dean for Student Academic Affairs, CAS Dean's Office (apatricoski@luc.edu).

Lecture Outline (tentative / subject to change)

Week	Date	Chapter	Topic
1	01/17	14	NO CLASS: Holiday
	01/19	15	Infrared Spectroscopy and Mass Spectrometry Review;
2	01/24	15	¹ H and ¹³ C NMR Spectroscopy
	01/26	15	¹ H and ¹³ C NMR Spectroscopy
3	01/31	15	¹ H and ¹³ C NMR Spectroscopy
	02/02	16	Molecular Orbital Theory; Conjugated Systems; 1,2 vs. 1,4 additions to 1,3-dienes,
4	02/07	16	Diels-Alder Reactions
	02/09	17	Aromatic Compounds and Ions,
5	02/14		EXAM I
	02/16	17	Aromatic Compounds and Ions, Huckel's rule
6	02/21	17	Aromatic Compounds and Ions,
	02/23	18	Reactions of Aromatic compounds
7	02/28	18	Reactions of Aromatic Compounds
	03/02	18	Reactions of Aromatic Compounds
8	03/07		NO CLASS: SPRING BREAK
	03/09		NO CLASS: SPRING BREAK
9	03/14	19	Aldehydes and Ketones, Nomenclature, Physical properties
	03/16	19	Aldehydes and Ketones; Reactions, Synthesis
10	03/21		EXAM II
	03/23	20	Carboxylic Acids, Nomenclature, Physical Properties, Acidities
11	03/28	20	Carboxylic Acids: Reactions; Syntheses " W " day
	03/30	20	Carboxylic acid derivatives Reactions; Synthesis
12	04/04	22	Amines: Nomenclature, Physical Properties, Basicities/Acidities of Salts
	04/06	22	Amines: Reactions, Synthesis
13	04/11	21	Condensations of carbonyls; alpha substitution
	04/13	21	Condensations of carbonyls; alpha substitution
14	04/18		EXAM III Classes starting after 04:00 PM are held
	04/20	24	Carbohydrates
15	04/25	24	Carbohydrates
	04/27	25	Amino Acids
16	05/04		Wednesday, MAY 04: FINAL EXAM 07:00 PM START TIME