Loyola University Chicago

Syllabus Organic Chemistry A CHM 223 Sec. 015; Monday, August 30 - Friday, December 10 Fall 2021
Lecture: **M, W, F: 04:10 PM - 05:00 PM**; **FLANNER 133 (FLANNER AUDITORIUM)**
Instructor: Donald May Contact: **dmay4@luc.edu Office**: **Flanner Hall 403**: HOURS: **TO BE DETERMINED**
All Discussions FLANNER 105: 016 W, 08:10 AM – 09:00 AM ; 017 W, 09:30 AM – 10:20 AM
018 W 02:50 PM – 03:40 PM Required Materials: **Textbook**: **ORGANIC CHEMISTRY**
by David Klein; **4th edition** Students can purchase the hardcopy or the e-text.
Optional: - Student Study Guide and Solutions Manual,

Molecular Model Kit: check with bookstore as they apparently have several choices available;
Other examples:
Duluth Labs: https://duluthlabs.com/pages/product-comparison
Pearson Prentice-Hall: ISBN-13: 978-0205081363
Darling Molecular Visions: ISBN-13: 978-0964883710

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 designed 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: Lecture and discussion. 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 problems will be given from the textbook but will not be graded. Students are expected to attend the discussion on time; students must have the graded discussion handout initialized by the instructor to possibly obtain credit; Graded discussion handouts may be assigned and be submitted as a group, or may be assigned on an individual student basis, thus each individual student must turn in their own individual 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. Students must attend the lecture/discussion to receive the handout and to turn in the original initialized handout, by the due date; early handouts are accepted. Students are expected to attend the discussion on time; students must have the discussion handout initialized by the instructor to possibly obtain credit; 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. Students must attend the lecture/discussion to receive the handout and only the original initialized handout, by the due date will be accepted; early handouts are accepted. Original initialized handouts will only be accepted: Attached e-mail or electronic copies of discussion handouts will not be accepted. 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). The instructor reserves the right to modify any and all of the course requirements at any time, including exam dates, course %-grade correlation, order of chapters/topics covered.

Final course grade assigned: **A**: 100% – 88.0% **A-** : 87.9% - 83.0%
B+: 82.9% - 78.0% **B**: 77.9% - 73.0% **B-**: 72.9% - 68.0%
C+: 67.9% - 63.0% **C**: 62.9% - 58.0% **C-**: 57.9% - 53.0%
D+: 52.9% - 48.0% **D**: 47.9% - 43.0% **F**: < 43.0%

Grading: Semester grades will be determined by the following criteria: discussion handouts at 10%, Three unit exams with the comprehensive final; Students are responsible for obtaining all graded materials, which will be returned as soon as possible, usually during the next scheduled discussion. Final grades will be determined from one of the following unit exams / final exam contribution options, whichever is higher:

EXAM DATES: (Tentative): EXAM I: MONDAY, SEPTEMBER 27, 2021, EXAM II: MONDAY, OCTOBER 25, 2021, EXAM III: MONDAY, NOVEMBER 22, 2021, FINAL EXAM 08:00 PM – 10:00 PM THURSDAY, DECEMBER 16, 2021 SULLIVAN CENTER AUIDTORIUM

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%

Final grades will be determined from one of the following exam contribution options, whichever gives the higher grade/percent:
OPTION 1: All three (3) unit exams at 20% each = 60% + final exam 30% = 90%
OPTION 2: Best two (2) unit exams at 20% each = 40% + final exam 50% = 90%

OPTION 1: Discussion Homework: 10%
3 Unit Exams@60% + Final Exam@30%
Total: 100%

OPTION 2: Discussion Homework: 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. 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. Students must turn in all exam pages when finished. Exams cannot be taken from lecture: see Academic Integrity Violations. Students must bring and present their Loyola I.D. for each exam.

FINAL EXAM: The University sets the schedule and following rules for all final exams. The final will be held on:

12/16/2021, Thursday	**08:00PM - 10:00PM**	**SULLIVAN CENTER AUDITORIUM**

Students will have a specified total time to complete the exam. Additional time will not be granted, even if you start late. 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).

PASS/FAIL CONVERSION DEADLINES and AUDIT POLICY.
A student may request to convert a course into or out of the "Pass/No-Pass" or "Audit" status only within the first two weeks of the semester. For the Fall 2021 semester, students are able to convert a class to "Pass/No-Pass" or "Audit" through Monday, September 13th. Students must submit a request for Pass/No-Pass or Audit to their Academic Advisor.
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

The instructor reserves the right to amend any or all of the constituents, requirements and policies of this syllabus at any time.
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/)
Fall 2021 Masking Requirement
It is Departmental policy that, even in the event the University relaxes its universal requirement for indoor mask-wearing during the Fall 2021 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).
Only students officially enrolled in the course may attend. Students must attend the discussion 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 courtesy and 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/professional matters before lectures/discussions/exams. Additionally, radios, headphones, cell-phones or similar devices must be in silent mode and are not permitted during lectures/discussions/exams. If a cell phone rings (beeps, buzz, etc.) during discussions or lectures or exams, the student will be asked to leave. Students missing lecture or discussion are responsible for obtaining the notes and related information from a classmate. Any power-point presentation utilized will be uploaded and made available on SAKAI. Not all contingencies can be listed but inappropriate conduct will be addressed. 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, since this constitutes using an outside resource. Students are expected to take care of any professional/personal issues before the exams. 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: non-religious caps, hats, hoods, visors and so forth, will not be allowed to be worn during exams. All personal materials, besides pencils, calculators and erasers, will be put away. Other exam instructions will be given and thus it is expected that students will be on time and ready for the start of the exam. Students engaged in official university off-campus activities will need to plan proactively for missed course assignments, in providing the appropriate signed documentation in advance of the date missed. The visual or audio recording of the lectures and discussions is not allowed generally but exceptions can be made for extraordinary circumstances.

Online Class Specifics
The university may return to an on-line format. Specific requirements will be indicated and the syllabus updated.

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 (For on-line homework, students creating multiple accounts will be considered in violation of academic integrity). Anything submitted that is incorporated as part of your grade in this course must represent your own work, unless indicated otherwise. All exams are self-contained: closed book and closed note. No external materials/notes/books or personnel are allowed: no unauthorized resources. During exams, violations include but are not limited to: cell phone ringing, opening a book-bag or back-pack during an exam, using unauthorized notes or books, looking at another student's exam, talking to another student, opening and/or utilizing anything in your book bag without the instructor's consent, taking a copy of the exam from the room and so forth. Students caught cheating will receive a zero score for the exam and this exam will not be allowed to be dropped: Option 1 above will automatically apply. Further actions will also result. Any student found to be in violation or cheating will, at minimum, be given a zero for the assignment/exam contribution and the incident will be reported to the Chemistry & Biochemistry Department Chair and the Office of the CAS Dean. Depending on the seriousness of the incident, additional sanctions may be imposed. Academic Dishonesty also includes, but is not limited to, 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.

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.

Course Practices Required: Attending lectures and discussions on time; College-level writing skills on exams; Communication skills for discussion and articulation of questions; Completion of homework and reading assignments. It is recommended that the student read through each chapter before lecture and eventually work through the suggested problems.

Learning Objectives: Students who successfully complete this course will be able to do the following at an acceptable level, which includes but is not limited to: Relate molecular orbital hybridization to bonding types, angles, geometry; Name and draw simple and more complex organic structures; Predict both physical and chemical properties of alkanes, alcohols, alkenes, alkynes and alkyl halides; Differentiate between isomer types (structural and stereo) and conformers; predict and name different stereoisomers; Describe and differentiate between various mechanisms, such as elimination versus 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 nuclear magnetic resonance (NMR), infrared (IR), ultraviolet (UV), and mass spectrometry (MS) data to identify structures; predict the spectroscopic data from the structure

Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):
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/athleteadvising/attendance.shtml)

Accommodations for Religious Reasons
If you have observances of religious holidays that will cause you to miss class or otherwise effect your performance in the class you must alert the instructor ***within 10 calendar days of the first class meeting of the semester*** to request special accommodations, which will be handled on a case by case basis.

Disability Accommodations: Students requiring accommodations at the University need to contact the Coordinator of Services for Student Accessibility Center (SAC), Sullivan Center. Accommodations are provided after receiving documentation from SAC Testing and allowance of a reasonable time frame for arrangements (minimally, one week in advance). Accommodations cannot be retroactive. Contact: http://www.luc.edu/sac/
Mission "to support, service, and empower Loyola University Chicago students with disabilities" and to "Partner with faculty and staff to provide opportunities for collaboration, professional development, personal growth, and staff interaction, as they relate to students with disabilities." Please direct all questions concerning accommodations of disabilities to the Student Accessibility Center. Academic accommodations afforded to students require documentation and review. The Student Accessibility Center will issue accommodation letters for registered students to present to their instructors: accommodations are not active until students present these letters to their instructors. If students' accommodations involve attendance or deadlines, instructors and students will jointly complete and execute an Agreement Form articulating their terms. The Student Accessibility Center stands ready to work with you.

Academic Calendar, www.luc.edu/academics/schedules
Important Dates:
Monday, September 06: No classes: Holiday (Labor Day)
Monday, Tuesday, October 11, 12: No classes: Fall Break
Friday, November 05: Last day for "W" otherwise "WF"
Monday, November 08: Spring 2022 registration
Wednesday-Friday, November 24-26: No classes: Holiday (Thanksgiving)

EXAM DATES: (Tentative): EXAM I: MONDAY, SEPTEMBER 27, 2021,
EXAM II: MONDAY, OCTOBER 25, 2021, EXAM III: MONDAY, NOVEMBER 22, 2021,
FINAL EXAM 08:00 PM – 10:00 PM THURSDAY, DECEMBER 16, 2021 SULLIVAN CENTER AUDITORIUM

Lecture Outline (tentative, subject to change)

Week	Date	Chapter	Topic *
1	08/30	01	Constitutional isomers, Lewis structures
	09/01		bonding, resonance
	09/03		formal charges
2	09/06		***NO CLASS*** Labor Day Holiday
	09/08	02	Molecular Orbital Theory, hybridization, bond rotation
	09/10		Alkanes, nomenclature, constitutional isomers revisited
3	09/13	02, 03	Acid-Base conjugates
	09/15		Curved arrow notation
	09/17	04	Constitutional isomers revisited, Newman Projections/conformational analysis
4	09/20		Cycloalkane nomenclature
	09/22	04	Chair conformations
	09/24	04	Chair conformations
5	09/27		**EXAM I**
	09/29	05	Stereochemistry, chirality/chirality R, S configurations
	10/01	05	chirality centers enantiomers, optical activity
6	10/04	05	Fischer Projections;, diastereomers
	10/06	06	Alkyl halides, nomenclature, properties
	10/08	06	Reaction rates and mechanisms
7	10/11		***NO CLASS*** Midterm Break
	10/13	06, 07	Alkyl Halides; SN2 E2
	10/15	07	reaction mechanisms
8	10/18	07	SN1, E1,
	10/20	08	Alkene nomenclature, alkene stability
	10/22	14	degrees of unsaturation
9	10/25		**EXAM II**
	10/27	08	Alkene reactions, halogenations
	10/29	08	hydration, carbocation rearrangements
10	11/01	08, 09	Hydroxylation, oxidative cleavage; Syntheses
	11/03	09	Alkynes, nomenclature, reactions
	11/05	09	Syntheses ("W" DAY)
11	11/08	10	Free radicals, bond dissociation energy
	11/10	10, 11	Radical mechanisms, reaction profile
	11/12	11	Syntheses
12	11/15	12	Alcohols, classification, properties, nomenclature
	11/17	12	Reactions of Alcohols: oxidation, halogenation
	11/19	12	dehydration (E1 revisited), carbocation rearrangements
13	11/22		**EXAM III**
	11/24		***NO CLASS*** Thanksgiving Break – Holiday
	11/26		***NO CLASS*** Thanksgiving Break – Holiday
14	11/29	14	Infrared Spectroscopy (IR)
	12/01	14	Infrared Spectroscopy (IR)
	12/03	14	IR spectra interpretation, Mass Spectrometry (MS)
15	12/06	13	Ethers; nomenclature, physical properties
	12/08	13	Synthesis
	12/10	13	reactions of ethers
16	**12/16**	**THURSDAY**	**FINAL EXAM 08:00 PM – 10:00 PM SULLIVAN CENTER AUDITORIUM**