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**Chemistry 223-002**  
**Summer 2019 – Syllabus**

**Course:** Chemistry 223, Organic Chemistry A, 3 Credits, Lecture and discussion  
**Prerequisites:** Chemistry 102 or 106 – a student missing a prerequisite may be withdrawn at any time  
**Lecture:** MWF 12:00-2:40 pm Flanner Hall 7

**Instructor & Contact Information** Dr. Sandra Helquist, Flanner Hall 200B (shared office suite)

Email policy: if you are emailing me about this course, you may either: (1) reply directly to one of my messages, which are sent via Sakai and therefore automatically labeled with our course number or (2) type "Chem 223-002" in the subject line of your email (and nothing else) and send to shelquist@luc.edu. Doing either of these will ensure that I read your message and reply within 24 hours Monday-Friday or 48 hours on weekends during this term.

Office Hours policy: informal, after class MWF. You are also welcome to stop by my office with any questions, thoughts, concerns, and other issues. Additional office hours, in person and online may be held by announcement or by appointment.

**Course Materials** Organic Chemistry, Klein, 3<sup>rd</sup> edition, hard copy or eText (Required); WileyPlus online (Required) Highly recommended: Molecular Modeling Kit. The solutions manual for the textbook is also recommended; the books are on reserve at the library. Daily access to Loyola email, Sakai site [sakai.luc.edu](http://sakai.luc.edu) and WileyPlus are also required to receive communications from the instructor and to access course materials, assignments, scores. Calculators may not be used.

### Course Content & Objectives

Content-specific Objectives Topics will include: nomenclature, structures, properties, reactions, mechanisms and synthesis of alkanes, alkyl halides, alkenes, alkynes, alcohols and ethers; study of molecular structure, geometry, and properties; functional groups; reactive organic species; stereochemistry; spectroscopy; spectrometry.

If successful, the student will be able to:

1. identify the various classes of organic compounds, their methods of preparation, and typical reactions.
2. name and draw specific organic compounds.
3. visualize and interpret multiple representations of organic molecules depicting connectivity, configuration, and conformations.
4. postulate logical reaction mechanisms for organic reactions.
5. discriminate among relative stabilities of reactive intermediates.
6. plan and write out single and multi-step syntheses using known reagents and conditions.
7. identify and compare general physical properties of organic compounds.
8. analyze, interpret, and predict spectral data (MS, IR, NMR) used in identifying organic compounds.
9. describe and analyze how organic chemistry affects the way we live and die.

IDEA Objectives These objectives include learning outcomes beyond this course and will apply across multiple courses and disciplines as you develop as an independent learner at Loyola. These have been selected by the faculty to apply to all sections of Organic Chemistry:

1. Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
2. Learning to *apply* course material (to improve thinking, problem solving, and decisions)
3. Learning how to find, evaluate, and use resources to explore a topic in depth
4. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view

**Expectations** I expect you to show up on time for each class and to come prepared, having kept up with the material by working homework, reading in the textbook and accessing resources for help. I expect you to use class and office hours to learn the material by engaging with classmates and asking questions. You will need to contact a classmate for notes, topics, sections, covered if you miss a class. Make-up assignments are not available in this course. Be courteous: save electronic messaging for after class. Plan your schedule so you have at least 25 hours per week outside of class for reading, working problems, asking questions, i.e., studying (learning) the material on a Daily Basis. You may require up to 40 hours per week depending on prior preparation for this course. Make time (hours) for this course every day: do not count on cramming on weekends or just before quizzes and exams as you will be much less likely to master the course objectives listed above.

**Accommodations** Students requiring accommodations must provide appropriate documentation from the University and meet with the instructor to discuss arrangements. Accommodations are provided after receiving documentation and allowance of a reasonable time frame for implementation: minimally, one week in advance of an exam. Accommodations cannot be retroactive. Students with disabilities should visit: <http://www.luc.edu/sac/>

**Academic Integrity** You are encouraged to study with other students on a daily basis, however, anything submitted for an individual grade during or outside of class must represent your own knowledge and understanding of the material. Evidence of unauthorized collaboration will result in, at a minimum, a “zero” on the item and penalty up to failure of the course, as well as referral to the Dean’s Office. For the Undergraduate Catalog statement on academic integrity, visit: [http://www.luc.edu/academics/catalog/undergrad/reg\\_academicintegrity.shtml](http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml)

**Grading** Graded assessments (homework, quizzes, exams) will be used to assess your level of mastery of the Course Content and Objectives as listed on the first page of this syllabus, and Course Grades will be assigned based on the quality of achievement you demonstrate on graded assessments. Extra/make-up assignments are not available for this course.

Your Chemistry 223 grade will depend on the following: Homework 10% + Quizzes 15% + Exams 75% = Total 100%

Letter grades are based on fixed percentages for this course so that all students are graded using consistent standards.

Generally, 85.0% is the lowest A-; 70.0% is the lowest B-; 55.0% is the lowest C-; 40.0% is the lowest D. Cutoffs for plus/minus grades within letter ranges will be determined by the overall distribution of course scores at the end of the term.

**Homework:** The purpose of these assignments is to help all students keep pace with the class by preparing ahead for each class. You will get as much benefit from these assignments as you choose to put forth in your individual effort by reading ahead and quizzing yourself by attempting the problems without assistance, then seeking clarifications and help as needed. Assignments will be due pre-lecture, WileyPlus, online, 4-5 days per week. Additional information is posted on Sakai.

**Quizzes:** The purpose of quizzes in general is for the benefit of the student as a learning tool: use the feedback you receive to correct your misconceptions and adjust your daily studying habits to learn the course material. The purpose of the dropped quiz policy is to account for unavoidable absence by the student: every missed quiz receives a score of zero. No early quizzes, no make-ups! Quizzes will be given individually and/or in groups, at least one quiz per week. Most quizzes will be given during class, and dates/times/content of quizzes may or may not be announced in advance. Keep up! Come to class prepared! The lowest quiz score will be dropped at the end of the term; all remaining quiz scores will be averaged by percent, so that equal weight is given to each quiz.

**Exams:** The purpose of the exams is to assess your individual level of mastery of the Course Content and Objectives. No early exams, no make-ups! Unexcused absence (traffic, weather, oversleeping, forgetfulness, etc) results in a ZERO. Excused absences require documentation of an unforeseeable emergency but do not result in a make-up exam.

- Midterm Exams: 55 minutes, Mondays June 3, June 17, 19% each toward course grade. Chemistry material is highly cumulative across courses and semesters: all exams will require application of prior knowledge (general and organic).
- Final Exam: 2 hours, Friday June 28<sup>th</sup>, 37% of course grade. The final exam is Mandatory and Comprehensive, with emphasis on material covered after 2<sup>nd</sup> midterm exam, to be discussed in class.

**Exam Procedure:** Use of your own models is permitted. Phones, other electronic devices, calculators are not permitted. If seen or heard, will be confiscated along with exam copy and student will be asked to leave. Come to the exam with Photo ID. All purses, bags, jackets, etc must be closed and removed from desk/chair and inaccessible during exam. Once the exam is distributed, if you exit the room (quietly, please), for any reason before time is up, your exam is completed. I will return your exams (copies will be kept) for the midterms only. Scoring errors must be brought to my attention in person no later than one week after the exams are returned. The final exam cannot be returned.

**Participation (Optional):** Details to be posted on Sakai, topic must be confirmed in person in the first week of class.

### **Homework/Textbook Problems: Preparation, Practice, Self-Assessment**

Required: WileyPlus assignments online. Very Highly Recommended: using additional resources for critical self-assessment – working extra problems – in WileyPlus and from your textbook, and the Orion adaptive practice system as needed. The required homework assignments include the minimum amount of preparation you will need pre-lecture; almost all students will need additional pre- and post-lecture practice with the material in order to achieve a satisfactory level of learning (in order to earn a passing course grade). Reading the textbook is not sufficient, reading solutions to problems is not sufficient: watching other people solve problems is not sufficient: you must solve problems and answer questions individually, without the aid of notes, textbook, google, tutors, solution manuals. What does this mean? You should study (learn) 4 or more hours every day by answering questions: practicing until you can rapidly recognize problem types, state the concept(s) being addressed in any question (say it out loud to yourself when practicing), identify subtle differences between problems and correct your own mistakes. This amount of practice usually starts with the aid of your book and other resources, but must conclude with you solving problems without any help – and knowing immediately when you have correctly answered a question and WHY your answer is correct. When you cannot differentiate problem types, ask for help. When you cannot find and correct your mistakes, and when you do not understand the difference between your answers and posted solutions, ask for help. Drill yourself every day on specific problem types as much as needed, and then study with classmates who will quiz you on mixed problems types so that you learn to expect the unexpected and do not learn to rely on brute force memorization or on your notes/book/other every time you encounter an unfamiliar problem type. The purpose of homework problems is to help you learn the material but this requires critical self-assessment as you work problems: you must know how completely you are learning the material so you do not overestimate your competency prior to exams. Re-read the course objectives on the first page of this syllabus now and review the list frequently.

## Tentative Lecture Schedule & Attendance Policy

Our actual pace is highly likely to vary from this schedule: if you miss a class for any reason, it is your responsibility to immediately contact a classmate for notes/topics covered. I do not provide notes, outlines or summaries. We will not cover every topic in every chapter of the textbook this term. Focus first on the material that is directly covered and assigned or recommended. Explore the additional material in the textbook for your own interest and enrichment.

Week	Dates	Monday	Wednesday	Friday
1	May 20, 22, 23	Ch.1: Review of Structures & Bonding Theories, Geometry & Polarity, Physical Properties; Ch.2: Representations and Resonance, Curved Arrows, Functional Groups; Ch.14: Infrared (IR) Spectroscopy; Ch.3: Acidity & Basicity		
2	May 27, 29, 31	MEMORIAL DAY "make-up" content via Sakai	Ch.3: Lewis Acids & Bases; Ch.4: Alkanes, Nomenclature, Conformational Analysis, Cycloalkanes, Cyclohexane Chair; Ch.5: Stereochemistry, Chirality, Configurations	
3	June 3, 5, 7	<b>MIDTERM I</b> Ch.5: Fischer Projections, leftovers	Ch.6: Energy, Equilibrium & Kinetics, Mechanisms; Ch.14: Mass Spectrometry (MS); Ch.7: Alkyl Halides, Substitution & Elimination Reactions	
4	June 10, 12, 14	Ch.7: Reaction Conditions & Selectivity, Predicting products, Alkenes; Ch.15: NMR Spectroscopy, signals, chemical shift; Ch.8: Alkene additions, synthesis, retrosynthetic analysis		
5	June 17, 19, 21	<b>MIDTERM II</b> Ch.8: leftovers, synthesis	Ch.9: Alkynes & Acetylide Ion Reactions, Synthesis ; Ch.10: Radicals, Mechanisms, Selectivity; Ch.11: Synthetic Strategies, Retroanalysis	
6	June 24, 26, 28	Ch.12: Alcohols, Acidity, Organometallics, Synthesis, Organic Redox Reactions; Ch.13: Ethers, Epoxides		Ch.13: leftovers <b>FINAL EXAM</b>

## Best Practices

1. Form a study group: be accountable to yourself and others. Learn from and teach your peers: share your own best practices and suggestions.
2. Memorization is not sufficient: Understanding the material is crucial. There are many ways to state this distinction, for example: you need to know more than the chemistry content, you must understand the chemical concepts. You should already have some experience with this distinction from your General Chemistry courses as well as having learned that simply trying to remember content does not typically lead to sustained learning.
3. Chemistry material, by nature, is highly cumulative. You must have good to excellent understanding of many concepts from General Chemistry in order to build on that knowledge as you begin to learn Organic Chemistry. The material we cover in the first few chapters of the Organic textbook will likewise lay the foundation for your entire study of Organic Chemistry, and we will refer back to basic concepts and principles incessantly and relentlessly, during this and the 2<sup>nd</sup> semester course.
4. To deal with the highly cumulative nature of the material, the best plan is to study (by practice) every day. Break it up into 30-60 minute sessions, stop when you have reached your limit for new content and take a break, give yourself time to process, assimilate (sleep overnight) and review. In the summer, plan on a total of 4-plus hours every day, every week.
5. Foundational concepts, trends and patterns are your friends. If you attempt to memorize everything separately, you will have great difficulty distinguishing problems types and will soon reach your limit of remembering even the basic content. You will be asked to recognize, explain and predict trends in structure, properties and reactivity, so get curious! It is one thing to know what happens, but it is often more satisfying to know why it happens.
6. Even though I am asking you not to rely strictly on memorization, you will still have to remember content. Remembering is a prerequisite for understanding, apply, and analyzing: these three levels of learning will form the basis for your exams: [https://media.ccoonline.org/ccco/FacWiki/TeachingResources/Blooms\\_Taxonomy\\_Tutorials/BloomsTaxonomy\\_Verbs\\_Pyramid/BloomsTaxonomyVerbsPyramid.swf](https://media.ccoonline.org/ccco/FacWiki/TeachingResources/Blooms_Taxonomy_Tutorials/BloomsTaxonomy_Verbs_Pyramid/BloomsTaxonomyVerbsPyramid.swf) As you continue in your undergraduate coursework, the transitions from 100- to 200- to 300-level courses will lead to higher-order thinking skills being emphasized for your learning and required in your assessments.
7. Take ownership of your learning. It is up to you to determine your level of achievement in this and other courses.
8. Learn from your mistakes, and help your classmates learn from theirs. This is part of critical self-assessment.
9. Practice, practice, practice. Ask and answer and ask more questions every day.

## Other Items

A link to the official Loyola calendar can be found here: <http://luc.edu/academics/schedules/index.shtml>

The Withdraw deadline for the term is Friday June 21<sup>st</sup>

For information about Loyola tutoring in the Sullivan Center, see: <http://www.luc.edu/tutoring/>

Links, Resources, and other items will be posted regularly on Sakai

Best wishes for a successful term!