

## Chemistry 223-002 Summer 2016 – 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**Prerequisites:** Chemistry 102 or 106 – a student missing a prerequisite may be withdrawn at any time  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 12:30-3:10 pm Cuneo Hall 302

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

**Email policy:** to receive a response, either use the email function in Sakai to send to Instructor (via select recipients) and leave subject line blank OR use your Loyola email address and put only “Chem 223-002” in the subject line, send to shelquist@luc.edu; in most cases I will be able to respond within 24 hours Monday-Friday.

**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, Wade, 8<sup>th</sup> edition, Prentice Hall, hard copy or eText (Required)

Highly recommended: Organic Chemistry I: As a Second Language, Klein and use of a Molecular Modeling Kit (bring your kit with you to class). The solutions manual for the textbook is also recommended; the books are also on reserve at the library. Daily access to your Loyola email account and Loyola’s Sakai site [sakai.luc.edu](http://sakai.luc.edu) 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 problems, 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/sswd/>

**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 (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: Participation 4% + Quizzes 16% + Exams 80% = 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.

**Participation:** The purpose of participation assignments is to help all students keep pace with the class, as well as to inform the instructor and the class of common misconceptions. You will get as much benefit from these assignments as you choose to put forth in your individual effort. Assignments will be due pre/post-lecture and during lecture, using both online submission via Sakai and paper submission as appropriate. Each assignment will be worth one point, and will be graded based on timely and meaningful completion. Remember, there are no make-up assignments for this course.

**Quizzes:** The purpose of quizzes in general is for the benefit of the student as a learning tool: use the feedback you receive to adjust your daily studying habits. 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, in class and/or as take-home activities. Most quizzes will be given in 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: 1 hour, Mondays June 6, June 20, 20% each toward course grade. Chemistry material is highly cumulative across courses and semesters: all exams will require application of prior knowledge.
- Final Exam: 2 hours, Friday July 1<sup>st</sup>, 40% 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, such as Loyola ID or Driver’s License, and leave visible on desk during exam to be checked. 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.

### **Homework: Preparation, Practice, Self-Assessment**

Very Highly Recommended: On quizzes and exams you will be expected to answer questions and solve problems, so you should study Every Day by answering questions and solving problems, i.e., applying the concepts discussed in class and read from your textbook to non-generic compounds. For drilling on particular topics, use the Klein book in addition to the Wade textbook problems. When you cannot answer a question correctly on the first attempt, do not dismiss it, and proceed to the solutions manual at your own risk! Figure out WHY you made the mistake (particularly important if you cannot identify the type of problem or if you have a misconception about the material), WHY the correct answer is correct, HOW you can recognize and apply the correct concepts and methods for solving that type of problem in the future, and FINALLY, attempt several more problems of that type until you can solve on the first attempt without assistance, and can recognize and distinguish that type of problem from closely related problems. Come to class and office hours for help with any part of this process as often as needed, especially if you do not understand why/how you are making particular mistakes. **Pre-lecture:** The purpose of reading ahead and working problems within the textbook sections is to help you come prepared to get the most out of our class time: I expect you bring questions to class. **Post-lecture:** Review notes/textbook as needed, then complete as many of the end-of-chapter exercises as possible every day. Ask yourself, every time, “What type of problem is this?” The purpose of these problems is to help you continue to learn the material and to self-assess, critically and honestly, so you can gauge your progress toward meeting the course objectives. Use these to determine how much help and extra practice you need on a daily basis and prior to exams. A list of Very Highly Recommended textbook problems will be posted on Sakai. You may also wish to work practice problems with your classmates in regular study groups, as well as quizzing each other with mixed problem sets (to see whether you can recognize, analyze and solve any problem in any context). I will reserve a few minutes at the beginning of each class to answer questions about the homework problems.

## 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, as you are still responsible for all material covered and assigned. I do not provide notes, outlines or summaries. Any powerpoint slides used in class will be posted as a pdf on Sakai. We will not cover every topic in every chapter of the textbook this term. 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.

Week	Dates	Monday	Wednesday	Friday
1	May 23, 25, 27	Ch.1: Intro/Review, Bonding & Structures, Acidity & Basicity, Nucleophiles & Electrophiles, Curved Arrows & Mechanisms; Ch.2: Bonding Theories, Geometry, Polarity, IM Forces, Functional Groups; Ch.12: Infrared (IR) Spectroscopy		
2	May/June 30, 1, 3	MEMORIAL DAY	Ch.3: Alkanes, Nomenclature, Conformers, Cycloalkanes; Ch.5: Chirality, Stereoisomers	
3	June 6, 8, 10	<b>MIDTERM I</b> Ch.5: leftovers Ch.4: Radical Halogenation	Ch.4: Reaction Selectivity, Thermodynamics & Kinetics, Reactive Species; Ch.6: Alkyl Halides, Substitution & Elimination Rxns & Mechanisms	
4	June 13, 15, 17	Ch.7: Alkenes, Unsaturation, Nomenclature; Ch.12 Mass Spectrometry (MS); Ch.7: Alkene Stability & Synthesis; Ch.8: Electrophilic Additions to Alkenes, Selectivity & Mechanisms, Organic Synthesis, Polymerization		
5	June 20, 22, 24	<b>MIDTERM II</b> Ch.13: NMR Spectroscopy	Ch.12,13: Combination Spectroscopy Problems Ch.9: Alkynes & Acetylide Ion Reactions, Synthesis Ch.10: Alcohols, Acidity, Organometallics, Synthesis	
6	June/July 27, 29, 1	Ch.10,11: Organic Oxidations & Reductions, Reagents Ch.11,14: Alcohols, Ethers, Epoxide Reactions		Ch.14 (leftovers) <b>FINAL EXAM</b>

## Best Practices

- 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.
- 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.
- To deal with the highly cumulative nature of the material, the best plan is to study (by practice) every day. Break it up, know when you have reached your limit for new content and take a break, give yourself time to process and assimilate before moving on to even more new material. In the summer, plan on 3-5 hours every day, every week.
- 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.
- 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 assessment. If you are curious, check out this interactive pyramid depicting Bloom's Taxonomy: [http://media.cconline.org/ccco/FacWiki/TeachingResources/Blooms\\_Taxonomy\\_Tutorials/BloomsTaxonomy\\_Verbs\\_Pyramid/BloomsTaxonomyVerbsPyramid.swf](http://media.cconline.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 include transitions to higher-order thinking skills being emphasized for your learning and assessed in your coursework.
- Form a study group. Learn from and teach your peers. Share your own best practices and suggestions.
- Take ownership of your learning. It is up to you to determine your level of achievement in this and other courses.
- Learn from your mistakes, and help your classmates learn from theirs. This is part of critical self-assessment.
- 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 24<sup>th</sup>

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

Links, Resources, and other items will be posted under Course Materials on Sakai

Best wishes for a successful semester. Please ask me to provide additional help as needed.