

## Chemistry 223-002 – Summer 2015 Lecture Syllabus

<b>Course:</b>	Chemistry 223, Organic Chemistry A, 3 Credits, Lecture and discussion First semester of a two semester sequence for non-chemistry majors.
<b>Prerequisites:</b>	Chemistry 102 or 106 – a student missing a prerequisite may be withdrawn at any time
<b>Lecture:</b>	MWF 8:30-11:10 am Cuneo Hall 302
<b>Instructor:</b>	Dr. Sandra Helquist
<b>Email:</b>	shelquist@luc.edu - put "Chem 223-002" in the subject line to receive a response
<b>Office:</b>	Flanner Hall 200B
<b>Office Hours:</b>	Immediately following class, by appointment, by announcement Online office hours will be held prior to exams via Adobe Connect
<b>Textbook:</b>	<u>Organic Chemistry</u> , Wade, 8 <sup>th</sup> edition, Prentice Hall, hard copy or eText (Required) Molecular Modeling Kit (Highly Recommended) Organic Chemistry I As a Second Language, Klein (Highly Recommended) Study Guide and Solutions Manual to above text, Wade & Simek (Recommended)

### 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.

The student should learn how to:

1. Identify the various classes of organic compounds, their methods of preparation, and typical reactions.
2. Name and draw specific organic compounds.
3. Postulate a *logical* reaction mechanism for simple organic reactions.
4. Discriminate amongst relative stabilities of reaction intermediates.
5. Plan and write out multi-step syntheses using known functional group transformations.
6. Prepare for basic identification/purification/separation techniques of organic compounds required in the lab.
7. Analyze and interpret data from instruments used in separating and identifying compounds: IR, NMR, MS.

*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 factual knowledge (terminology, classifications, methods, trends)
2. Learning fundamental principles, generalizations, or theories
3. Learning to *apply* course material (to improve thinking, problem solving, and decisions)
4. Learning how to find and use resources for answering questions or solving problems
5. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view

**Course Materials** Bring your books and modeling kit to class and use them! You should become familiar (if not already) with Sakai at [sakai.luc.edu](http://sakai.luc.edu), to be used for announcements, posting of course materials, grades, etc. Answer keys for in-class assessments will commonly be posted on 2<sup>nd</sup> floor Flanner display case. Emails to the class will be sent from Sakai as necessary, so you must plan to regularly check your luc.edu email account. You will not be permitted to use a calculator on exams.

**Expectations** I expect you to come to each class on time and prepared by reading ahead in the book and working a few simple practice problems. I expect you to ask questions as often as possible when you need clarifications and assistance with the material, and I expect you to actively participate with your classmates during class time with the goal of learning the concepts by practice. Make-up assignments are not available for this course. Contact a classmate for notes, sections/topics covered if you miss a class. We will take a short, ~5-minute, break during each class meeting. Be courteous: save your electronic messaging for the break or after class. Plan your schedule so you have at least 20 hours per week outside of class time available for reading, working problems, asking questions, i.e., studying & learning the material on a Daily Basis. Some students may require up to 40 hours per week outside of class to keep up with the course. Plan on a few hours every day, i.e., do not count on cramming it all in on the weekends as this is unlikely to lead to real and lasting understanding of the course material.

*What can you expect of the instructor?* I expect to provide you with support, guidance, and encouragement as we work toward the course objectives listed above, both for the organic chemistry content, and for the broader IDEA objectives. I enjoy conceptual challenges, problem-solving, and trying to figure out why and how students make mistakes in order to correct misconceptions. Please ask me to provide additional help as needed.

**Academic Integrity** Research and learning in chemistry relies heavily on collaborative efforts. You are encouraged to study with other students in and out of class, however, anything submitted for an individual grade must represent your own knowledge and understanding of the material. On in-class quizzes and exams you are expected to obtain information only from your own mind. Any student found to participate in Academic Cheating will receive, at a minimum, a “zero” on the item and penalty up to automatic failure of the course, as well as referral to the Dean’s Office. For the full University statement on Academic Integrity, including Academic Cheating (scroll down), visit: [http://www.luc.edu/academics/catalog/undergrad/reg\\_academicintegrity.shtml](http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml)

**Grading** The purpose of the graded assessments (quizzes, exams) is primarily to gauge your level of understanding of concepts, as well as your ability to analyze problems in order to solve by applying chemical concepts. You will be assessed on the Course Content and Objectives as listed on the first page of this syllabus, and Course Grades will be assigned based on the level of achievement you demonstrate on graded assessments.

Your Chemistry 223 grade will depend on the following: Quizzes 20% + Exams 80% = Total 100%

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 are not published as they will be determined by the overall distribution of course scores.

**Quizzes:** No early quizzes, no make-ups! Quizzes (4-5 total) will be given in class and/or as take-home activities. Date/ time of quizzes may or may not be announced in advance. 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) to obtain the overall quiz contribution to the course grade. Every missed quiz receives a score of zero – no early quizzes, no make-ups! Keep up with the material and use the feedback you receive to adjust your daily studying habits.

**Exams:** No early exams, no make-ups! A normal class will follow each of the midterm exams. Unexcused absence (traffic, weather, oversleeping, forgetfulness, etc) results in a ZERO. Excused absences require documentation of an unforeseeable emergency situation but will not result in a make-up exam.

- Midterms: 1 hour, Mondays, June 1 and June 15, 20% each toward course grade. Course material is highly cumulative: the 2<sup>nd</sup> midterm will require continued application of the concepts covered before the 1<sup>st</sup> midterm
- Final Exam: 2 hours, June 26, 40% of course grade. The final exam is Mandatory and Comprehensive, with emphasis on material covered after 2<sup>nd</sup> midterm.

**Exam Procedure:** Use of your own models are 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: experience dictates that positive outcomes for learning that you are able to demonstrate on exams is directly proportional to working and UNDERSTANDING the assigned problems on a regular basis, i.e., applying the concepts discussed in class and read from your textbook to non-generic compounds. On quizzes and exams you will be expected to answer questions and solve problems, so you should study by answering questions and solving problems. When you cannot answer a question correctly on the first attempt, do not dismiss it! 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. Seek assistance 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 these assignments are to help you come prepared to get the most out of our class time, and I do expect you to read the textbook before attempting these problems, as well as bringing questions about these items to class. While you complete the problems you should be able to assess your understanding of the textbook material. Homework will be due 11:59pm SuTuTh, online at [MasteringChemistry.com](http://www.masteringchemistry.com): we have complimentary access for this course. Details for registering are posted on Sakai in Course Materials. Homework is not part of your grade (see Grading section above), however, I will offer up to 6 points bonus to be applied to the final exam, with the scoring details to be announced in class and posted online. Assignments must be completed online.

**Post-lecture:** The purpose of these problems are to help you 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 assistance and extra practice you need on a daily basis and prior to exams. Review notes/textbook as needed, then complete as many of the in-chapter and end-of-chapter exercises as possible after every class meeting. List of very highly recommended problems to be posted on Sakai, for your own practice, preparation, self-assessment.

**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/>

### **Tentative Lecture Schedule & Attendance Policy**

Introduce yourself to multiple classmates early in the course. Our actual pace may 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, but you can always gauge where we are with the material by checking the MasteringChemistry pre-assignments.

Week	Dates	Monday	Wednesday	Friday
1	May 18, 20, 22	Ch. 1: Introduction, Review, Structures	Ch. 2: Bonding, Geometry, Polarity	Ch. 2,3: IM Forces, Alkanes, Conformers
2	May 25, 27, 29	MEMORIAL DAY	Ch. 3-4: Cycloalkanes, Radical Halogenation	Ch. 4: Rxn Selectivity, Thermo, Kinetics
3	June 1, 3, 5	<b>MIDTERM I</b> Ch. 5: Stereochemistry	Ch. 5,6: Stereochemistry, Alkyl Halides, S <sub>N</sub> 2 Rxns	Ch. 6: S <sub>N</sub> 1, S <sub>N</sub> 2, E1, E2 Rxns & Comparison
4	June 8, 10, 12	Ch. 7,8: Alkenes, Synthesis, Rxns	Ch. 8: Alkene Reactions, Organic Synthesis	Ch. 9: Structure, Alkyne & Acetylide Rxns
5	June 15, 17, 19	<b>MIDTERM II</b> Ch. 10: Alcohols	Ch. 10, 11: Alcohols, Synthesis, Reactions	Ch. 11, 14: Alcohols, Ethers, Epoxide Rxns
6	June 22, 24, 26	Ch. 12: Spectroscopy IR and MS	Ch. 13: Spectroscopy NMR	Ch. 14 (leftovers) <b>FINAL EXAM</b>

### **Best Practices**

1. 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.
2. 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 five 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.
3. 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 of the week.
4. 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.
5. 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.
6. Form a study group. Learn from and teach your peers.
7. Ask questions. Of yourself, of your classmates, of the instructor.
8. Learn from your mistakes. This is part of critical self-assessment.
- 9; Practice, practice, practice. Answer questions and solve problems every day.

### **Additional Information**

- The Center for Tutoring & Academic Excellence generally offers free walk-in tutoring during the summer. Check the website for information: <http://www.luc.edu/tutoring/index.shtml>
- The Withdraw deadline for the course is Friday June 19<sup>th</sup>  
[http://luc.edu/academics/schedules/summer/academic\\_calendar.shtml](http://luc.edu/academics/schedules/summer/academic_calendar.shtml)