

## Chemistry 101-011 – Fall 2016 – Syllabus

<b>Course:</b>	Chemistry 101, General Chemistry A, 3 Credits: Lecture and discussion
<b>Prerequisites:</b>	A satisfactory performance on the Loyola math proficiency test, or completion of Math 117 with a grade of C- or better. A student may be withdrawn from the course at any time if the prerequisites have not been satisfied.
<b>Lecture:</b>	MWF 9:20 – 10:10 am Section 101-011
<b>Discussion</b>	You must attend the section for which you are registered: Thursdays 10:00am, 1:00pm or 2:30pm
<b>Instructor</b>	Dr. Sandra Helquist
<b>Email</b>	Send via Sakai to Instructor (select recipients) and leave subject line blank or from send to shelquist@luc.edu – put only <u>Chem 101-011</u> in subject line to receive a response – typical response time is within 24 hours during weekdays when classes are in session.
<b>Office</b>	Flanner Hall 200B (shared office, please knock and wait for a response)
<b>Office Hours</b>	You are welcome to stop by at any time to see if my door is open and check my posted schedule Scheduled office hours: just show up with your questions, no appointment needed Mondays 1:40-2:40pm; Tuesdays 10:00-11:00am; Wednesdays & Fridays 10:30am-12:00pm

### Course Materials

The textbook/eText is Required for class (*Chemistry The Central Science*, Brown/LeMay/Bursten/Murphy/Woodward, 13<sup>th</sup> edition; can use textbook copies on reserve at the Library); the student guide and/or solutions manual that accompany the text are Optional. Students that choose to use an alternate version of the textbook must do the extra work to align their reading/figures/problems with the current edition. Web access is Required for use of the MasteringChemistry online homework system (can purchase code with textbook) and Sakai (see [sakai.luc.edu](http://sakai.luc.edu) and [www.masteringchemistry.com](http://www.masteringchemistry.com)). Emails will be sent to the class via Sakai (to your Loyola account). Each student will need a scientific calculator for problem solving – only calculators approved for use on the ACT exam are permitted – all calculator memory must be cleared prior to use on exams. Calculators cannot be shared between students.

### Course Objectives

This course is the first in a two-semester sequence of general chemistry. We will focus on building a conceptual understanding of fundamental chemical principles including properties of atoms, molecules, states of matter, and chemical reactions. Students will learn the language of chemistry and develop their skills in scientific problem solving and critical thinking. This will serve as a foundation for further study in chemistry, other sciences and related disciplines.

- Differentiate types of matter based on their chemical and physical properties (for example, pure substances vs. mixtures, metals vs. nonmetals, ionic vs. covalent vs. metallic, electrolyte vs. nonelectrolyte).
- Use multiple perspectives of matter (macroscopic, particle, symbolic levels) to qualitatively describe and explain characteristics, properties, and relationships of the following: atomic structure, nuclear chemistry, periodicity, molecular structure, chemical bonding, chemical reactions, thermochemistry, aqueous solutions, gases.
- Quantify relationships between variables controlling chemical systems.
- Solve quantitative multistep problems combining multiple concepts within the systems.
- Differentiate among closely related factors, categorize problem types, and select appropriate tools to solve these problems.
- Apply chemical principles to explain natural phenomena.

**IDEA Objectives:** Chosen by the faculty for emphasis in General Chemistry courses

- Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories)
- Learning to *apply* course material (to improve thinking, problem solving and decisions)
- Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc)
- Learning how to find, evaluate, and use resources to explore a topic in depth

### Course Outline & Class Attendance

We will cover most of Chapters 1-10 and 21 during the semester. A tentative Lecture schedule will be posted on Sakai and will be updated as needed. We will begin with Chapter 1 on the first day of class, but not all textbook sections will be fully covered, so focus first on the material that is directly covered in lecture and assigned for homework, quizzes and recommended problems. An outline of topics will be posted on the board before each lecture to assist you with follow-up, detailed, reading of the textbook, but you should also prepare for lecture by skimming the book for the topics listed on the tentative schedule. Class attendance and active participation is vital for your learning and is expected of all students. You are responsible for all material presented or handed out, as well as reading and problems recommended in lecture and discussion. If you miss a class for any reason, contact a classmate promptly to get the notes.

## Time Investment

For a first-semester general chemistry course, it is anticipated that the average independent working time (outside of class) required to learn the material in order to achieve a minimal passing grade of C- is 1-2 hours per day, every day, not just before exams, of pre-and post-lecture reading, homework, office hours, group study sessions, additional preparation, spent by the student. This time is merely an estimate and it is up to each individual student to devote the time necessary to achieve the desired course grade. Studying needs will also vary depending on the prior knowledge of each student and the ability to master cumulative concepts in the course material as the semester progresses.

## Classroom Guidelines

- A “participant” is any person present in the classroom. These guidelines are the product of students’ in-class discussions and independent submissions collected via online homework during Fall 2015. These guidelines went into effect after in-class group review & discussion, and allowance of time for additional feedback to the instructor.
- All participants are expected to respect, value, and encourage each other’s contributions in the classroom. This will be done by:
- Participants actively listening to each other’s presentations, questions and answers. Distractions (side conversations, use of personal devices, other) will be kept to a minimum.
- Participants asking questions individually and in groups; participants engaging in problem-solving individually and in groups.
- Correct, incorrect, incomplete and partial answers to questions will be critically but respectfully examined and discussed to cultivate conceptual understanding of material from multiple perspectives.
- Participants will seek to engage with the material by finding areas of personal interest and exploring topics further by asking questions and seeking additional resources for information.

## Student and Faculty Expectations

Each student will determine her/his level of learning in the course. I expect each of you to take ownership of your learning early during the semester, and to adjust your daily practices and habits as needed to reach your desired level of achievement in the course. It is up to you to access resources for help as often as needed: office hours, tutoring, study groups, mentoring, and more. What can you expect of me? My primary objectives are to provide you with the tools, environment, encouragement, and support to learn Chemistry. I expect that all of us will work together to follow the classroom guidelines stated above and to master the course objectives listed on the first page of this syllabus. Please ask me for additional assistance, clarifications, and contact to me to provide feedback as needed.

## Academic Integrity

You are encouraged to study with other students in and out of class, however, anything submitted for an individual grade during or outside of class must represent your own knowledge and understanding of the material. Evidence of cheating (for homework, quiz, or exam) 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)

## 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. Information for students with disabilities is available at: <http://www.luc.edu/sswd/>

## Other Items

- A tentative Lecture Schedule is posted on Sakai (Course Materials) and will be updated as needed.
- A list of Highly Recommended Textbook problems is posted on Sakai (Course Materials). You also have access to the Study Area in MasteringChemistry which includes extra practice problems.
- A link to the official Loyola calendar can be found here: <http://luc.edu/academics/schedules/index.shtml>
- The Withdraw deadline for the semester is Friday November 4<sup>th</sup>. Students wanting to drop lecture after midterm may stay in the co-requisite Chem 111 lab only if midterm grade, posted in LOCUS, is a D or better. No exceptions. Students should continue to attend lecture until the week of the drop date to gain as much background knowledge as possible. Students can seek assistance from the Department office (Flanner 125) beginning Monday 10/31 at 9:00am through Friday 11/4 at 4:00pm.
- For information about Loyola tutoring in the Sullivan Center, see: <http://www.luc.edu/tutoring/>
- Additional resources will be continually posted and updated on Sakai.

<b>Grading</b>	Homework	15%	<u>Cutoffs:</u>	A 92.5%	A- 90.0%
	Quizzes	15%	B+ 87.5%	B 81.0%	B- 78.0%
	<u>Exams</u>	<u>70%</u>	C+ 75.0%	C 69.0%	C- 65.0%
	Total score	100%		D 50.0%	

These are the grade cutoffs for Total scores. Letter grades are only assigned to your Total score, not to individual assignments, quizzes or exams. Total scores are not rounded up after calculation. Chemistry is not easy to learn, thus the grading policy rewards students for keeping up with the material via completion of homework and quizzes, as well as two grading options for the exams (see details below). Note that both grading options for the exams give more weight to the final exam than to a midterm exam. Each student will receive an estimated midterm grade following the second exam, before the withdraw deadline, and final course grades at the end of the semester are posted only on LOCUS. Homework scores are visible in MasteringChemistry; quiz and exam scores will be recorded in Sakai.

## Homework

Due 11:59pm TuThSu, online, at <http://www.MasteringChemistry.com>. Scoring details are listed online. MC questions include problems over a range from easy to moderate to difficult-level questions and are meant to: (1) Help you learn the material by practicing it yourself; (2) Serve as an aid to your overall course grade as you make the effort to learn. Each assignment will contain on average, 40-50 minutes of material. Monday assignments will include review material throughout the term. Take your time doing homework problems: they are meant to help you learn, they are not exam-specific preparation. Questions will include additional examples and further applications of concepts covered in lecture, but you must still read the textbook in detail, every word, and work the sample and practice exercises in detail before attempting the homework problems. Work problems mindfully, review feedback provided even after you obtain a correct answer, and review any incorrect answers as well to determine why/how you can distinguish from the correct answer. The more you focus on doing the problems to learn from them (rather than doing them simply for completion/class credit), the less time you will need to spend working additional problems later, or trying to cram for quizzes or exams. If you struggle with a homework problem, come to office hours promptly for help. Completion of homework problems is the minimum amount of practice required for learning: most students will need to reinforce knowledge and further develop their problem-solving skills by working additional textbook problems daily.

## Quizzes

No early quizzes, no make-ups! *Any missed quiz is scored as a zero.* 15 minutes long, held at the beginning of every discussion. Quizzes include easy to moderate free-response questions and are meant to: (1) Help you evaluate yourself and receive feedback prior to exams; (2) Serve as an aid to your overall course grade if you keep up with the material: your best ten scores will be averaged for your final grade. In general quiz questions will reflect material from the past 2-3 classes, but much of the course content is cumulative so you will always need to apply prior knowledge in order to solve the problems. Occasionally I will specify a topic or two for an upcoming quiz: pay attention and write it down!

## Exams

No early exams, no make-ups! Exams will consist of multiple-choice questions. Exams comprise 70% of your overall course grade, and will be automatically calculated as the higher score between these two options:

Option 1: All 3 midterms, 15% each; final exam, 25%; Total exam score = 70%

Option 2: Best 2 midterms, 15% each; final exam, 40%; Total exam score = 70%

Midterms: 50 minutes, September 21, October 21, November 18. If you miss a midterm *for any reason*, Option 2 will automatically be used to determine your grade. A second missed midterm will result in a score of *zero* counted in your course grade. It is in each student's best interest to prepare for and take all exams.

Final: 2 hours, Saturday December 17, 1-3 pm. *Mandatory: a missed final exam will result in a course grade of F.* The final exam must be taken on the date scheduled per College of Arts and Sciences policy.

## Exam Procedures

Phones, tablets, wireless devices, etc are not permitted. If seen or heard, device will be confiscated along with exam copy and student will be dismissed. Seating arrangements may be altered before and during the exam. Show up early with three items: (1) your Loyola ID, visible on desk to be checked; (2) working pencil(s); (3) working approved calculator ([www.actstudent.org/faq/calculator.html](http://www.actstudent.org/faq/calculator.html)), with the memory cleared, to be checked, extra batteries are recommended. All jackets, bags, loose accessories, etc must be left at the front of the classroom. Once the exam is distributed, if you exit the room (quietly, please), for any reason before time is up, your exam is complete and will be collected. I will return your midterm exam scoring sheets *during the discussion periods or in office hours* (copies are kept) and the exam questions will be posted on 4<sup>th</sup> floor Flanner by the elevators. 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.

## Best Practices & Suggestions

Students often ask me, “How do I get a/an (fill in grade of choice here) in this class?” The answer is simple (see the grading policy for the course), but the process of learning is challenging and can even be uncomfortable as you are pushed to expand the boundaries of your knowledge and abilities. Grades are earned based on quality of achievement in the course, with the top grade of ‘A’ earned by demonstrating complete (not partial) mastery of all (not some/most) of the course material on all homework, quizzes and exams: trying to take a shortcut in one area will often be detrimental in another area. So what does it mean to demonstrate mastery of course material? Please refer back to the first page of this syllabus for the overview of Course Content and Objectives: you will be assessed on all of these. Please continue reading for the best suggestions I have from my own experience as a student and as a teacher, and the experiences of my mentors, colleagues, and former students. There are also documents from your textbook author and other chemistry faculty posted on Sakai under Course Materials.

1. Memorization is not sufficient: Understanding the material is essential. 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 previous Chemistry course(s) 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 Chapters 1-3 in order to build on that knowledge as you begin to learn the rest of the material during the semester. The material we cover in this term will likewise lay the foundation for continued studies in chemistry, biology, and other sciences using this course as a prerequisite. As you continue in these courses, your instructors will refer back to foundational general chemistry concepts and principles incessantly and relentlessly.
  3. To deal with the highly cumulative nature of the material, the best plan is to study by working problems every day. Work the required and recommended problems until you can complete them on the first attempt without assistance from your notes, book or the solutions manual. Ask yourself each time: what type of problem is this? Break up your studying, 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 academic year, plan on 1-2 hours every day of the week. Falling behind is unacceptable if you wish to fundamentally understand the concepts in order to apply them to solve problems.
  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 memorization is not sufficient in this course, you will still have to remember content. Remembering is a prerequisite for Understanding and Applying, and these two levels of learning will form the basis for your assessment. [http://media.cconline.org/ccco/FacWiki/TeachingResources/Blooms\\_Taxonomy\\_Tutorials/BloomsTaxonomy\\_VerbsPyramid/BloomsTaxonomyVerbsPyramid.swf](http://media.cconline.org/ccco/FacWiki/TeachingResources/Blooms_Taxonomy_Tutorials/BloomsTaxonomy_VerbsPyramid/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. You will need good to excellent understanding of the concepts covered in this course in higher-level courses. Cram and forget is not a recipe for long-term success.
  7. Form a study group. Learn from and teach your peers.
  8. Ask questions. Of yourself, of your classmates, of the instructor.
  9. Learn from your mistakes. This is part of critical self-assessment.
  10. Practice, practice, practice. Ask/answer questions and solve problems every day.
- Reflect on your own experiences and list your own best practices here, then share them with me and your peers:

## Exam-specific Preparation

If you are solving problems and asking questions on a Daily Basis, you have already studied for your Exams by learning the course material! Begin to review for each test a few days in advance. You may wish to use the Chapter Summary, Key Terms, and Key Skills listed at the end of each chapter as a review tool, or to make your own study guides from lecture outlines or quizzes prior to exams. Find a review method that works for you: meet with classmates and quiz each other, make your own quizzes from the textbook problems and/or Mastering Study Area, bring additional questions to office hours. When you are taking any exam, read the instructions and questions carefully, spend your time well on problems you know you can solve, and write out your work so you can check it.

*Best wishes for a successful semester. Let me know what I can do to help you succeed. – Dr. Helquist*