

## Chemistry 101-001 – Fall 2012 Lecture 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 A student may be withdrawn from the course at any time if the prerequisites have not been satisfied.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>	Section 101-001 MWF 9:20-10:10 am Flanner Hall 133/Auditorium You must also be registered in one of the accompanying discussion sections:		
<b>Discussion:</b>	Tu 10:00-11:00 am	Cuneo Hall 202	Section 002
	Tu 1:00-2:00 pm	Cuneo Hall 117	Section 003
	Tu 2:30-3:30 pm	Cuneo Hall 117	Section 004
<b>Instructor:</b>	Dr. Sandra Helquist		
<b>Email:</b>	shelquist@luc.edu – put “Chem 101-001” in subject line to receive a response		
<b>Office:</b>	Flanner Hall 200B		
<b>Office Hours:</b>	M 12:30-2:30pm, Tu 11:15am-12:45pm, W 10:30am-12:30pm, F 12:30-2:30 pm Additional times by appointment or drop-in (see posted schedule outside my door)		
<b>Textbook:</b>	<u>Chemistry The Central Science</u> , Brown/LeMay/Bursten/Murphy/Woodward, 12 <sup>th</sup> edition MasteringChemistry online access code for the above text (Required)		

### Course Content & Objectives

This course is the first in a two-semester sequence of general chemistry. We will focus on building an 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 to build a foundation for further study in chemistry, other sciences and related disciplines.

### Course Materials

There is a required textbook for class and it is your option to purchase a student guide or solutions manual to accompany the text. Additionally, you must register for the MasteringChemistry online homework system ([www.masteringchemistry.com](http://www.masteringchemistry.com) & additional information/links posted on Blackboard). You will need the use of a scientific calculator for problem solving – your calculator does not need to graph, but the use of cell phone calculators will not be permitted during exams and quizzes. Calculators cannot be shared during exams and quizzes, and will never be provided by the instructor. Lectures will be presented as a combination of “chalk talks” and overhead or PowerPoint slides. All handouts from the lecture will be available on Blackboard ([blackboard.luc.edu](http://blackboard.luc.edu)) and scores will be recorded (each student should check these regularly to ensure accuracy) in the Blackboard grade center. The Announcements section of the course page on Blackboard will be used regularly to communicate useful information.

### Class Attendance

Vital for your learning: you are responsible for all material presented or handed out, as well as reading and problems recommended in lecture and discussion even if you are not in attendance for a course meeting. Attendance and Attention is important and expected of all students. Prepare for lecture by scanning the new material to be covered. Come prepared to engage in discussion, ready to ask questions on homework or yet unassimilated lecture material -- especially bring questions to discussion classes. If you miss a class for any reason, contact a classmate promptly to get the notes.

### 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 (homework, quiz, exam) must represent your own knowledge and understanding of the material. Any student caught 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 College of Arts and Sciences statement on academic integrity, visit: [http://www.luc.edu/cas/pdfs/CAS\\_Academic\\_Integrity\\_Statement\\_December\\_07.pdf](http://www.luc.edu/cas/pdfs/CAS_Academic_Integrity_Statement_December_07.pdf)

## Disability Accommodations

At times, students with disabilities may wish to avail themselves of the University's ancillary services. Students requiring accommodations at the University need to contact the Coordinator of Services for Students with Disabilities, then provide documents and schedule arrangements with the instructor at the beginning of the term. Information is available at: <http://www.luc.edu/sswd/>

## Grading

Your grade for Chemistry 101 will depend on the following factors:

Homework	15%
Quizzes	15%
<u>Exams</u>	<u>70%</u>
Total	100%

Generally, 90.0% is the lowest A-, 78.0% the lowest B-, 65.0% the lowest C-, 50.0% the lowest D. 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). Each student will be assigned an estimated midterm grade following the 2<sup>nd</sup> midterm exam.

## Homework

Online, at <http://www.MasteringChemistry.com>, can be accessed anywhere, on or off campus. 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. Additional information on getting started with MC is posted on Blackboard. If you struggle with a homework problem, come to office hours promptly for help. Students expecting the highest exam scores will further develop their understanding of the material and problem-solving skills by working practice and end-of-chapter exercises from the textbook on a daily basis.

## Quizzes

No early quizzes, no make-ups! 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. *Any missed quiz is scored as a zero.*

## Exams

No early exams, no make-ups! Exams will consist of multiple-choice questions; scoring sheets will be provided by the instructor. Exams comprise 70% of your overall course grade, and will be automatically calculated by the instructor 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, Friday September 21, Friday October 19, Wednesday November 14. 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*. It is in each student's best interest to prepare for and take all exams.

Final: 2 hours, Saturday December 15, 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 Day Procedure

Phones, tablets, mp3 players, etc 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 three items: working pencil(s), working calculator (extra batteries are recommended), and your Loyola ID visible on your desk to be checked during the exam. All purses, bags, jackets, etc must be left at front of the room. 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 score sheets (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.

## Tutoring Center

Free tutoring services will be offered beginning Monday, August 27th in Sullivan 245. To sign up for a tutoring group, students should visit: [www.luc.edu/tutoring](http://www.luc.edu/tutoring). Walk In tutor led study halls are also offered.

## Studying Strategies and Suggestions

Every semester, many students will ask, “how can I get an ‘A’ in the course?” The simple and difficult answer is that grades are assigned based on quality of achievement in the course, with an ‘A’ earned by demonstrating that you have achieved complete (not partial) mastery of all (not some or most) of the course material on all exams, quizzes and homework: there are no easy shortcuts.

*Time Investment:* For a first-semester general chemistry course, it is anticipated that the average time required to learn the material in order to achieve a passing grade of C- is 2-3 hours of independent working time outside of class (reading, homework, additional preparation) spent by the student for each 1 hour spent in lecture/discussion classes. 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 difficulty of the course material as the semester progresses.

*General Suggestions:* There are some things in any subject that must simply be memorized. Chemistry is no exception. Most commonly, you will be asked to learn systematic naming conventions, definitions and formulas, as well as important, fundamental constants and equations. You may find it helpful to make notecards or keep lists of important definitions to quickly master the material as needed to keep pace with the class. You are encouraged to form study groups – talk to the people sitting next to you in lecture or discussion and exchange phone numbers or email addresses – and attend office hours or tutoring regularly to receive help. You are urged to contact the instructor to discuss problems before they become serious.

*Step-By-Step Daily Studying Practices aka Learning the Course Material:* Because many topics we will cover build heavily on prior material, the best plan is to study chemistry regularly, every day, similar to practicing the piano or training for a competitive sport. Before each lecture, it is expected that the student will quickly scan the chapter/sections to be covered (sections are generally covered in order throughout the semester), taking note of key definitions, formulas and concepts, in order to improve lecture comprehension. After lecture, detailed re-reading of the textbook is appropriate, along with working the practice exercises contained within the text sections to immediately test comprehension of the material covered. The student is then expected to ask follow-up/clarifying questions as necessary, and to complete the assigned homework problems by the next lecture meeting. Additional rounds of questions for the instructor are appropriate, brought to office hours or discussion classes in particular. Finally, the student should work as many end-of-chapter problems as needed to gain comprehensive understanding of the material, and repeat the process of working problems and asking questions as needed. Each student must practice, practice, practice solving problems on a daily basis to learn the material.

*Reviewing for Exams:* Experience dictates that positive outcomes (for exam scores and course grades) are directly proportional to working and understanding the assigned and suggested problems on a regular basis, applying the concepts learned in lecture to a wide range of compounds and calculations. Overnight exam cramming usually will not produce success. If you have followed the step-by-step daily studying practices as listed above, you will have already studied for your exams, and can 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: study with classmates and quiz each other, make your own quizzes from the MasteringChemistry Study Area, bring additional questions to office hours.

*Suggestions for Success During the Exams:* Familiarize yourself with strategies for answering multiple-choice questions. No partial credit is given, but you will often be able to eliminate some of the answer choices to make an educated guess if you have some knowledge of the material. At the beginning of every exam, look through all of the questions and decide where to begin. Pace yourself: do not spend too much time on any single question and prioritize your time where it will be well spent. If you are stuck at the beginning, middle or end of any question, move on, and before time is called, fill in an answer for every question: there are no penalties for guessing. Do not try to work multistep problems solely in your head or in your calculator as you will not be able to check for and find your mistakes – always write out your work so you can come back to a problem later if you get stuck. Follow instructions given on and during each exam. You will lose points for failing to completely fill in your name and a 10-digit ID number, including bubbles, on your answer sheet, and for keeping your exam and/or score sheet after time is called. Only answers that are filled in on the score sheet will be graded.

### Recommended End-Of-Chapter Exercises

From your book: these are to be completed for your own daily practice after you have completed the homework and in-chapter exercises for each topic. Each of the questions listed below is a red-numbered exercise with an answer in the back of the textbook (starting on page A-1). All of the EOC's are worthy of your time, however, if you do not complete all of them, start with these. Work the problems without looking at the solutions manual: your goal is to solve these as if they were exam questions! Bring questions about these problems to office hours and discussion classes. For more practice with a particular topic, work the black-numbered exercises, or unassigned red-numbered exercises as needed.

- Chapter 1: 5, 9, 11, 13, 17, 23, 25, 27, 29, 33, 43, 45, 47, 53, 62, 65, 71, 77  
 Chapter 2: 4, 6, 1, 15, 17, 19, 21, 23, 27, 29, 31, 39, 41, 43, 47, 49, 53, 57, 59, 63, 65, 69, 73, 84, 90, 93, 98, 101, 104  
 Chapter 3: 1, 3, 5, 7, 11, 13, 17, 19, 23, 27, 29, 31, 33, 39, 43, 47, 51, 53, 57, 61, 63, 67, 69, 71, 75, 77, 81, 83, 85, 89, 93, 101, 105  
 Chapter 4: 1, 5, 7, 9, 15, 17, 21, 23, 27, 31, 37, 39, 41, 45, 49, 51, 55, 61, 63, 67, 69, 71, 73, 75, 79, 81, 83, 85, 87, 89, 92, 94, 96, 99, 103, 106, 109, 112  
 Chapter 5: 5, 11, 13, 19, 21, 25, 27, 31, 37, 39, 41, 43, 45, 47, 51, 53, 55, 61, 63, 65, 67, 69, 73, 75, 79, 102, 106  
 Chapter 6: 2, 5, 8, 11, 13, 15, 17, 23, 27, 31, 33, 35, 39, 43, 45, 49, 51, 53, 55, 59, 63, 67, 69, 71, 73, 75, 85, 90, 94, 97  
 Chapter 7: 7, 11, 15, 21, 23, 25, 27, 29, 31, 33, 37, 39, 41, 45, 47, 53, 55, 61, 63, 65, 71, 77, 88, 95, 103  
 Chapter 8: 1, 4, 7, 9, 13, 15, 19, 31, 33, 35, 37, 39, 41, 45, 47, 49, 51, 53, 55, 57, 59, 63, 65, 69, 71, 73, 75, 77, 85, 90, 107  
 Chapter 9: 1, 3, 5, 6, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 37, 39, 41, 43, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 89, 92, 94, 101, 110  
 Chapter 10: 4, 7, 10, 13, 21, 23, 27, 29, 31, 33, 37, 41, 43, 47, 49, 51, 53, 57, 59, 61, 63, 65, 67, 71, 75, 77, 79, 83, 85, 93, 95, 101, 108, 111, 123  
 Chapter 11: 1, 5, 6, 7, 11, 15, 17, 19, 21, 23, 25, 27, 29, 33, 35, 39, 41, 45, 47, 51, 53, 55, 57, 59, 61, 63, 73, 77, 82, 90  
 Chapter 12: 7, 9, 11, 13, 15

### Tentative Lecture Schedule: Contact a classmate for notes/topics if you miss a class!

Week	Dates	Monday	Wednesday	Friday
1	Aug 27, 29, 31	Introduction, Chemistry, Matter (Chapter 1)	Properties of Matter, Units, Conversions (Ch. 1)	Dimensional Analysis (Ch. 1)
2	Sept 3, 5, 7	LABOR DAY HOLIDAY	Atoms, Atomic Structure, Isotopes (Ch. 2)	Periodic Table, Molecules, Formulas (Ch. 2)
3	Sept 10, 12, 14	Ions, Ionic Compounds, Naming (Ch. 2)	Chemical Equations, Reactions (Ch. 3)	Formulas, The Mole, Molar Mass (Ch. 3)
4	Sept 17, 19, 21	Calculating Formulas (Ch. 3)	Formulas, Stoichiometry (Ch. 3)	<b>EXAM I Chapters (1-3)</b>
5	Sept 24, 26, 28	Percent Yield (Ch. 3) Solutions (Ch. 4)	Electrolytes, Aqueous Solubility, Acids, Bases (Ch. 4)	Exchange Reactions, Ionic Equations (Ch. 4)
6	Oct 1, 3, 5	Redox Reactions (Ch. 4)	Solution Concentration (Ch. 4)	Chemical Analysis, Titrations (Ch. 4)
7	Oct 8, 10, 12	MIDTERM BREAK	Energy, Thermodynamics (Ch. 5)	Enthalpy, Calorimetry (Ch. 5)
8	Oct 15, 17, 19	Calorimetry, Hess Law (Ch. 5)	Formation Enthalpies (Ch. 5) Light, Waves, Photons (Ch. 6)	<b>EXAM II Chapters (3-5)</b>
9	Oct 22, 24, 26	Photons, Quantization, Hydrogen Atom (Ch. 6)	Matter Waves, Quantum Mechanics (Ch. 6)	Electrons, Electronic Configurations (Ch. 6)
10	Oct, Nov 29, 31, 2	Periodic Properties, Trends (Ch. 7)	Trends, Octet Rule, Bonding (Ch. 7, 8)	Covalent Bonding, Lewis Structures (Ch. 8)
11	Nov 5, 7, 9	Bond Polarity, Lewis Structures (Ch. 8)	Lewis Structures, Formal Charge, Resonance (Ch. 8)	Bond Strength, Length Molecular Shape (Ch. 8, 9)
12	Nov 12, 14, 16	VSEPR, Molecular Properties (Ch. 9)	<b>EXAM III Chapters (6-9)</b>	Valence Bond Theory (Ch. 9)
13	Nov 19, 21, 23	Hybridization, $\sigma$ and $\pi$ Bonding (Ch. 9)	THANKSGIVING BREAK	
14	Nov 26, 28, 30	Gas Properties, Gas Laws (Ch. 10)	Ideal Gas Equation and Applications (Ch. 10)	Kinetic-Molecular Theory of Gases (Ch. 10)
15	Dec 3, 5, 7	Intermolecular Forces (Ch. 11)	Liquids, Phase Diagrams (Ch. 11)	Solids (Ch. 12)

**Saturday December 15, 1-3 pm**  
**FINAL EXAM Comprehensive: Chapters 1-12**