

Chemistry 101 - Spring 2020

General Chemistry A (3 credits; lecture and discussion)

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Prerequisites A satisfactory performance on the Loyola math diagnostic 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 A student may be withdrawn from the course at any time if the prerequisites have not been satisfied.

Lecture (101- 001) M, W and F 11:30 a.m. - 12:20 p.m.; CU 210

Discussions You must attend only the section for which you registered

101 – 002: F, 9:20 a.m. – 10:10 a.m.; CU 002

101 – 003: W, 2:45 p.m. – 3:35 p.m.; CU 002

Office Hours M and F, 2:00 p.m. – 3:30 p.m., FH 022; other times by appointment.

Course Materials and Resources

1. **Textbook Chemistry: The Central Science, 14th Edition** by Brown, LeMay, Bursten, Murphy, Woodward, and Stoltzfus. There are hardback and electronic versions of this book. You may purchase older versions of the textbook, but the newest version has the least number of errors. Page numbers and tables mentioned throughout the course refer to that appearing in the newest version of the textbook. The same applies to suggested problems at the end of each chapter. It is your responsibility to find the equivalent items in the older versions.
2. *MasteringChemistry* Course ID: **MCMOTADEFREITAS8822951** To learn how to enter answers into Mastering Chemistry, complete the assignment "Introduction to Mastering Chemistry" by Jan 17, 2020.
3. *Scientific Calculator* To complete problems on exams and quizzes, you will often need a calculator; thus, it should be brought to class for every lecture and discussion period. Dr. Mota de Freitas will NOT provide a calculator on the day of the exam. You can only use a nonprogrammable, non-graphing calculator on exams. Calculator backs/covers, sharing of calculators, and use of cell phone calculators are not permitted during exams. Such use is a breach of the Loyola Academic Integrity Code.
4. *Sakai System* Web access is required for Sakai. Course-related materials will be deposited in Sakai (see sakai.luc.edu for additional information/ recommendations). The instructor will upload lecture PowerPoint slides on Sakai, and will make every effort to have the materials posted on the site at least a day before the lecture. A word of foreknowledge is that the PowerPoint presentations can be quite large and hence, if you do not have a high-speed internet connection at home, you should consider using Loyola's computer resources to download the materials.

5. *Email* Check your Loyola email account regularly for messages sent to the class via Sakai.
6. **Copyright/Intellectual Property reminder:** course materials provided by your instructors at Loyola may not be shared outside any course without the instructor's written permission.

Course Description and Objectives

General Chemistry A (CHM101) is the first in a two-semester sequence for general chemistry. This course surveys the universal concepts and principles underlying all of the disciplines of chemistry, and describes how chemistry impacts our daily lives. The goals for this course are for you to understand conceptually how atoms combine to form molecules, how these molecules interact and react with each other, and how these reactions manifest in the real world. To accomplish these goals, we will develop problem-solving skills by using simple mathematical equations and learning how to correctly read, interpret, and comprehend graphs and tables. The ultimate goal will be to evaluate problems, make predications, and draw conclusions. At the end of this course, you will be able to:

- Demonstrate a basic comprehension of fundamental concepts in general chemistry by utilizing the correct vernacular and terminology;
- Determine the number of molecules, mass, and moles using stoichiometry, chemical logic, and reasoning;
- Apply periodic trends to predict chemical and physical properties of a given type of matter; and
- Determine the electronic structure of a given atom and/or molecules as well as discuss its impact on chemical bonding and reactivity.

Supplemental Instruction (SI)

There are SI group study sessions available to everyone in this course. Your SI is Antonio Castillo, a student who has excelled in the course and is double majoring in chemistry and education. See www.luc.edu/tutoring for session schedules. Students are asked to arrive with their Loyola ID, lecture notes, and textbook. It is most beneficial if you attend weekly, and come ready to work with your peers.

Course Repeat Rule

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W). After the second attempt, the student must secure approval for a third attempt. Read the full policy at this link (scroll down): <https://www.luc.edu/chemistry/courses.shtml>

Student Accommodations

Students with disabilities who seek accommodations in the classroom or other aspects of performing their coursework must first register with the **Student Accessibility Center (SAC)**

located at Sullivan Center, Suite 117, 6339 N. Sheridan Road Chicago, IL 60660. SAC staff members will work with students to obtain required documentation of disability and to identify appropriate accommodations as required by law. Information for students is available at <http://www.luc.edu/sac/>

Student Athletes and Student Involved with University Activities

Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and to receive notes or other written information distributed in the missed classes. Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time. <https://www.luc.edu/athleteadvising/attendance.shtml> Students must provide their instructors with proper documentation describing the reason for and date of the absence. This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible.

Academic Integrity

All students in this course are expected to have read and abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at <http://www.luc.edu/cas/advising/academicintegritystatement>

A basic mission of a university is to search for and to communicate the truth as it is honestly perceived. A genuine learning community cannot exist unless this demanding standard is a fundamental tenet of the intellectual life of the community. Students of Loyola University Chicago are expected to know, to respect, and to practice this standard of personal honesty. Academic dishonesty can take several forms, including, but not limited to cheating, plagiarism, copying another student's work, and submitting false documents.

Any instance of dishonesty (including those detailed on the website provided above or in this syllabus) will be reported to Professor Miguel Ballicora, the Chairperson of the Department of Chemistry & Biochemistry, who will decide what the next steps will be. Any student found cheating on any examination or quiz will receive a "0" for that assignment. Moreover, depending on the severity of the misconduct, a final grade of F may be assessed for the course. We remind you that such an incident will become part of one's personal record and may be transmitted to organizations, such as medical or dental schools, pharmacy and graduate programs.

Appropriate In-class Behavior and Electronic Devices

It is incumbent upon you, as a student, to maintain a professionalism and a code of conduct appropriate with the course material and course enrollment. To this end, rude and disruptive behavior (such as talking during class, viewing computer materials not concerning class subjects, etc...) will not be tolerated. It is acceptable to use laptops or comparable devices (tablets, iPads, etc.) for taking notes in class. Voice recording, but not visual recording, is allowed. Cell phones must be turned off during class. If your device is activated during class, you must leave the class immediately and cannot return for the duration of that class period.

Grading Policy

Homework	15%	<u>Cutoffs:</u>	A \geq 88%	A- 87 - 85%
Quizzes	15%	B+ 84 - 81%	B 80 - 75%	B- 74 - 71%
<u>Exams</u>	<u>70%</u>	C+ 70 - 67%	C 66 - 63%	C- 62 - 60 %
Total score	100%	D+ 59 - 55%	D 54 - 50%	F < 50%

These are the grade cutoffs for Total scores. Letter grades are only assigned to your Total score, and not to individual assignments, quizzes or exams. You will receive an estimated midterm grade before the withdraw deadline (March 23, 2020), and final course grades at the end of the semester are posted only on LOCUS. Grades are only based on the criteria listed in this syllabus: no substitutes, no extra credit assignments and no additional criteria will be considered.

Homework There will be a total of 12 homework assignments but only the 10 highest scores count towards your grade. No make-up homework assignments will be given. The maximum score for any homework assignment is 1.5% pts. Homework assignments are administered on Mastering Chemistry (<http://www.masteringchemistry.com>), and they are due at 11:59 pm on specific dates (see table below). You may use the book and work in groups on these problems. Each student is responsible for their own assignment. Once the due date has lapsed, the homework problems will be made available for additional practice.

<u>Due Date Assignment</u>		<u>Due Date Assignment</u>	
22-Jan	Chapter 1	25-Feb	Chapter 5
31-Jan	Chapter 21	06-Mar	Chapter 6
05-Feb	Chapter 2	17-Mar	Chapter 7
14-Feb	Chapter 3	25-Mar	Chapter 8
18-Feb	Chapter 4	17-Apr	Chapter 9
21-Feb	Chapter 4	24-Apr	Chapter 10

Quizzes In discussion periods, 20-min individual quizzes will occasionally be administered. There will be 7 discussion assignments but only the 5 highest scores count towards your grade. The maximum score for any quiz is 3% pts. There are no make-up quizzes. Discussion sections immediately preceding hour exams will be used for review, and no quizzes will be administered.

Exams Exams comprise 70% of your overall course grade, calculated as the HIGHER Total exam percentage between these two options:

Option 1: All 3 50-min exams, 15% each; final exam, 25%; Total exam % = 45% 50-min exams + 25% final

Option 2: Best 2 50-min exams, 15% each; final exam, 40%; Total exam % = 30% 50-min exams + 40% final

If you miss one 50 min-exam *for any reason*, Option 2 will be used to determine your grade. If you miss more than one test a make-up examination will be given at my discretion; a written doctor's or judge's or funeral director's note or equivalent, as well as notification to me prior to the test (via phone or e-mail) will be required for any missed test to be made up. Exams will consist of multiple-choice and short-answer questions and are completely individually.

Dates of 50-min Exams: Friday, Feb 7, Mon Mar 9, and Fri Apr 3. It is in your best interest to prepare for and take all exams. Extra time is not granted for late arrivals, including for the final exam. Final exam: 2 hours, Mon Apr 27, 1:00 - 3:00 pm. The University sets the schedule for final exams, and there can be no divergence from the posted schedule of dates and times. The final exam is Mandatory: a student who does not take the final will not pass the course.

Exam Procedures Phones, tablets, wireless devices, etc. are not permitted on your person. If seen or heard, device will be confiscated along with exam copy and student will be dismissed with a score of zero. Show up early with three items: (1) your Loyola ID, visible on desk to be checked; (2) working pencil(s); (3) working scientific calculator, 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, for any reason before time is up, do so quietly.

Tentative Lecture Schedule

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 and sections/topics covered, as you are still responsible for all material covered and assigned. We will not cover every topic in every chapter of the textbook this semester. 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.

Date	Week	Class #	Topic
13-Jan	1	1	Syllabus, Ch. 1: Introduction, Matter Representations
15-Jan	1	2	Ch. 1: Properties of Matter, Units, Scales
17-Jan	1	3	Ch. 1: Significant Figures, Problem-solving
20-Jan	Martin Luther King, Jr. Holiday, No Class		
22-Jan	2	4	Ch. 2: Atoms, Atomic Structure, Atomic and Mass Numbers
24-Jan	2	5	Ch. 2: Isotopes, Atomic Weights
27-Jan	3	6	Ch. 21: Radioactivity, Decay, Nuclear Stability
29-Jan	3	7	Ch. 21: Transmutations, Nuclear Energy
31-Jan	3	8	Ch. 21: Fission, Fusion
3-Feb	4	9	Ch. 2: Periodic Table, Molecules, Ions
5-Feb	4	10	Ch. 2: Compound Nomenclature and Formulas
7-Feb	4	11	Exam #1: Lectures 1 - 10
10-Feb	5	12	Ch. 3: Chemical Rxns & Equations
12-Feb	5	13	Ch. 3: Mole Concept, Mole Ratios & Stoichiometry
14-Feb	5	14	Ch. 3: Limiting Reactants, Reaction Yields
17-Feb	6	15	Ch. 4: Solutions, Electrolytes, Solubility
19-Feb	6	16	Ch. 4: Acids & Bases, Precipitation, Exchange Reactions
21-Feb	6	17	Ch. 4: Ionic and RedOx Equations Solution Stoichiometry
24-Feb	7	18	Ch. 5: Energy, Thermodynamics, Heat
26-Feb	7	19	Ch. 5: Enthalpy, Heat Transfer
28-Feb	7	20	Ch. 5: Hess's Law, Formation Enthalpies
2-Mar	Spring Break		
4-Mar			
6-Mar			
9-Mar	8	21	Exam #2: Lectures 12 - 20
11-Mar	8	22	Ch. 6: Waves, Photons, Energy, Quantization
13-Mar	8	23	Ch. 6: Hydrogen Atom; Quantum Mechanics, Orbitals
16-Mar	9	24	Ch. 6: Electron Configurations
18-Mar	9	25	Ch. 7: Periodic Properties
20-Mar	9	26	Ch. 7: Periodic Trends
23-Mar	10	27	Ch. 8: Octet Rule, Ionic and Covalent Bonding

25-Mar	10	28	Ch. 5: Bond Energies
27-Mar	10	29	Ch. 8: Electronegativity, Bond Polarity & Partial Charges
30-Mar	11	30	Ch. 8: Lewis Structures & Formal Charges
1-Apr	11	31	Ch. 8: Resonance Contributors & Octet Rule Exceptions
3-Apr	11	32	Exam 3: Lectures 22 - 31
6-Apr	12	33	Ch. 9: Molecular Shapes, VSEPR Model Geometry
8-Apr	12	34	Ch. 9: Geometry & Polarity
10-Apr	Easter No Class		
13-Apr			
15-Apr	13	35	Ch. 9: Valence Bond Theory, Hybrid Orbitals
17-Apr	13	36	Ch. 9: σ and π bonding
20-Apr	14	37	Ch. 10: Gas Properties, Gas Laws
22-Apr	14	38	Ch. 10: Ideal Gas Law Applications
24-Apr	14	39	Ch. 10: Kinetic-Molecular Theory; Real Gases
27-Apr	15	40	Cumulative Final Exam: Monday, 1:00 pm – 3:00 pm

Error Policy

The instructor reserves the right to amend or correct the syllabus.