

Syllabus – General Chemistry A

The purpose of this syllabus is to describe the course, resources, and policies. It is meant help all students understand the expectations and requirements for the course, and it should be used as a reference for questions about policies. When updates to the syllabus are made during the term, a new version will be posted electronically, and all students will be notified.

Course Information

Course: Chemistry 101 – General Chemistry A (3 credits: Lecture & Discussion)

Prerequisites: A satisfactory performance on the Loyola math diagnostic test, completion of Math 117 with a grade of C- or better, or the equivalent. A student missing a prerequisite may be withdrawn at any time.

Time Zone: This syllabus lists dates/times using Chicago local time (U.S. Central Time Zone)

Lectures: TTh 10-11:15 am, FH Auditorium

Discussions: You must attend the section for which you registered:

- Sec 002: Thursday 1-1:50 pm, FH 105
- Sec 003: Thursday 2:30-3:20 pm, FH 105
- Sec 004: Thursday 4:15-5:05 pm, FH 007

Course Coordinator: Dr. Patrick L. Daubenmire (pdauben@luc.edu)

Chemistry 101 is a multi-section lecture & discussion course with common content and common outcomes across all sections. This course includes a Final Exam during the Common Final Exam Period as scheduled by the University. The Course Coordinator is responsible for consultation and coordination with instructors regarding policies, exam writing, and grading. Your Section Instructor is responsible for communicating with you regarding all course content and policies and is the first and primary person you should contact with questions about all aspects of the course. As needed, all Section Instructors will consult with the Course Coordinator throughout the semester.

Instructor Contact Information

Section Instructor: Dr. Amy Balija

Office: FH 104

Email: abalija@luc.edu

Email timing: In most cases, I will respond within 24-48 hours Monday-Friday when classes are in session. You are encouraged to use Office Hours to get immediate answers to your questions, and to use your classmates as resources for help.

Office Hours Policy: Office hours are a time set aside by the instructor for students to ask questions in a smaller setting. Students are encouraged to come to office hours. No appointment is necessary during the times listed under Office Hours Schedule.

Office Hours Schedule: M 1-2 pm, FH 129
W 10-12 pm, STEM Resource Center, St. Joseph's Hall Cafeteria
F 11:30-12:30 pm, STEM Resource Center, St. Joseph's Hall

Cafeteria

Or by appointment

Required Course Materials

- Textbook: Chemistry The Central Science, Brown et. al., 14th edition; eText or hard copy
- Loyola email, Sakai (and integrated tools), Zoom, Gradescope, additional software & online resources
- Scientific Calculator (non-programmable, non-graphing, and independent of another device such as a phone or tablet)

- Additional web-based systems will be used for uploading your work and facilitating feedback and evaluation. Registration will be free but required. These may include [Gradescope](#) and other sites.
- Additional software may be used. Downloads will be free but required. These may include applications that convert photos to pdfs (examples: CamScanner, Scannable, GeniusScan), and collaboration materials for group work (example: OneNote).

Recommended Course Materials: Solutions Manual

Copyright/Intellectual Property reminder: Course materials provided by your instructors at Loyola, including my materials, may not be shared outside any course without the instructor's **written permission**. Content posted without permission will be in violation of Copyright/Intellectual Property laws.

Course Content & Learning Outcomes

This course is the first in a 2-term 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.

You will learn to:

- 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

Class Attendance & Course Coverage

Material comprehension and attendance is obtained via Plicker. Keep your Plicker card safe and bring it to every class.

Early in the course, you will be given an opportunity to provide contact information to other people and to introduce yourself to multiple classmates. If you miss a class for any reason, it is your responsibility to work through the content. Contact a classmate for further discussion of the topics as you are still responsible for all material covered and assigned.

An outline will be shown at the beginning of each class and uncompleted lecture notes/handouts/links/animations will be posted on Sakai. 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.

Classroom & Group Work Guidelines

The classroom is a space designed for learning. My expectations are that all voices will be heard and appreciated in the classroom, and that we will invite each other to engage while recognizing that contributions can take multiple forms.

Student and Faculty Expectations

Expectations of Students: I expect students to take ownership of their learning and to use office hours and SI sessions as learning resources. 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, but your needs will also vary depending on your prior knowledge and ability to master cumulative concepts in the course material as the semester progresses.

Expectations of Instructor: I will provide you with the tools, environment, encouragement, and support to learn Chemistry. Because the course objectives are based on what students learn, my teaching techniques include homework, groupwork, and active learning. I expect all of us will work together!

Student Accommodations

Loyola University provides reasonable accommodations for students with disabilities. Any student requesting accommodations related to a disability or other condition is required to register with Student Accessibility Center (SAC), located in Sullivan Center, Suite 117. Professors receive the accommodation notification from SAC via Accommodate. Students are encouraged to meet with their professor individually in order to discuss their accommodations. All information will remain confidential. Please note that in this class, software may be used to record class lectures in order to provide equal access to students with disabilities. Students approved for this accommodation use recordings for their personal study only and recordings may not be shared with other people or used in any way against the faculty member, other lecturers, or students whose classroom comments are recorded as part of the class activity. Recordings are deleted at the end of the semester. For more information about registering with SAC or questions about accommodations, please contact SAC at 773-508-3700 or SAC@luc.edu.

Course Repeat Rule

Students are allowed only THREE attempts to pass a particular chemistry course with a C- or better grade. The three attempts include withdrawals (W). The Department advises to complete a course with a grade of C or C-, and to demonstrate growth in future coursework, rather than to withdraw from a course.

After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website: <https://www.luc.edu/chemistry/forms/> and personally meet and obtain a signature from either the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

Academic Integrity

All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at:

<https://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 the Chair of the Department of Chemistry & Biochemistry who will decide what the next steps may be. Evidence of cheating in this course will result in, at a minimum, a score of zero (which cannot be dropped from grade calculations) and penalty up to failure of the course. College policies include that instructors will report incidents of academic misconduct to their chairperson as well as to the Assistant Dean for Student Academic Affairs in the CAS Dean's Office. I will report incidents to the Chemistry & Biochemistry Department for further action(s).

Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):

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. Students must provide their instructors with proper documentation i.e., "[Athletic Competition & Travel Letter](#)" 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 to the professor in the first week of a semester. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to allow the student to take the examination at another time. (<https://www.luc.edu/athleteadvising/attendance.shtml>)

Students who will miss class for an academic competition or conference must provide proper documentation to their instructor as early in the semester as possible.

Accommodations for Religious Reasons

If you have observances of religious holidays that will cause you to miss class or otherwise effect your performance in the class you must alert the instructor **within 10 calendar days of the first class meeting of the semester** to request special accommodations, which will be handled on a case by case basis.

Other Items

- A link to the official Loyola calendar can be found here: <https://www.luc.edu/academics/schedules/>
- The Withdraw deadline for the semester is on Monday, March 27, 2023.
- Loyola is using SmartEvals to provide instructor & course feedback. OIE will send emails near the end of the term.

Class Recording & Content Information

In general lecture, class sessions may be recorded. The following is a mandatory statement for all courses in the College of Arts & Sciences (CAS). We will discuss class norms and standards during the first week and continue the discussion as needed throughout the semester.

Privacy Statement

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student

activity that have been initiated by the instructor may be retained by the instructor only for individual use.

Additional Content, Copyright & Intellectual Property Statement

By default, students may not share any course content outside the class without the informed written consent of the owner of that content. This includes any additional recordings posted by students, materials provided by the instructor, and publisher-provided materials. For example, lectures, quiz/exam questions, book figures/slides, and videos may not be shared online outside the class. In some cases, copyright/IP violations may overlap with breaches of academic integrity. Remember that obtaining consent to share materials is an active process.

Pass/Fail Conversion Deadlines and Audit Policy

A student may request to convert a course into or out of the “Pass/No-Pass” or “Audit” status only within the first two weeks of the semester. For the Spring 2023 semester, students are able to convert a class to “Pass/No-Pass” or “Audit” through Monday, January 23rd. Students must submit a request for Pass/No-Pass or Audit to their Academic Advisor.

Health, Safety, and Well-Being On-Campus

Please be familiar with and adhere to all policies and protocols posted on the *Campus Info & Resources* site: <https://www.luc.edu/healthsafetyandwellbeing/campusinforesources/>

Final Exam

The University sets the schedule for all final exams. The final will be held on:

Wednesday, May 3, 2023, 7:00pm

Location will be updated on LOCUS when available. Please be sure to attend the final exam location assigned to your section of CHEM 101.

You will have exactly 2 hours to complete the exam. Additional time will not be granted, even if you start late. There will be no make-up final exams given under any circumstance, and the exam will not be given early, either.

Instructors may not reschedule final exams for a class for another day and/or time during the final exam period. There can be no divergence from the posted schedule of dates for final exams. Individual students who have four (4) final examinations scheduled for the same date may request to have one of those exams rescheduled. If a student reports having four final examinations scheduled for the same date, students should be directed to e-mail a petition to Adam Patricoski, Assistant Dean for Student Academic Affairs, CAS Dean’s Office (apatricoski@luc.edu).

In-Class Exams

Three exams will be administered in class on **2/16**, **3/23**, and **4/20**. Exam questions will emphasize material covered in lectures and assigned homework. The topics will be announced in advance.

Universal Absence Accommodation Policy

The purpose of a universal absence accommodation policy is to account for emergency circumstances (e.g., serious illness, caring for a family member, car accident) that require you to be absent from class, while maintaining fairness in grading for students who attend and complete all in-class graded assignments. We believe that class attendance and participation are essential for your success in this class, and that your health is important to us and our shared community. Please use good judgement and stay home if necessary/prudent for your circumstances.

This is the universal accommodation policy for in-class graded assignments:

- Students missing the Plicker question or a discussion section assignment must provide acceptable documentation for the grade of 0 not to be counted.

- A missed in-class exam due to absence for any reason is already accommodated in the course grading system. See grading scheme below.

You must provide documentation for an absence. This accommodation is automatically available to all students.

Course Grading System

The standards for each letter grade are listed here according to all required course components. Each student will receive a midterm grade via LOCUS at least one week prior to the Withdraw deadline for the semester. Grades are only based on the criteria listed in the syllabus: no substitutions, and no additions.

Grading Scheme

Participation	10% (Plicker 2%, Discussion Questions 8%)
Homework	15%
Exams	75%* (please see options described below for additional breakdown)
Total score	100%

*the final exam is mandatory to earn a passing grade

To reward improvement and to accommodate an exam absence, your Exams contribution to your course grade will be automatically calculated as the higher score between the two options listed here:

<u>Option 1:</u>	Average of three in-class exams	50%
	Final Exam	25%
	Exams contribution	75%

<u>Option 2:</u>	Average of best two in-class exams	45%
	Final exam	30%
	Exams contribution	75%

If you miss an in-class exam for any reason, Option 2 will be used to determine your grade. It is in your best interest to prepare for and take all exams. The final exam is **mandatory**: a student who does not take the final will not pass the course.

Letter Grade Cutoffs:

Grade	Percentage
A	93.00-100
A-	89.00-92.99
B+	85.00-88.99
B	81.00-84.99
B-	77.00-80.99
C+	73.00-76.99
C	69.00-72.99
C-	65.00-68.99
D	60.00-64.99
F	0-59.99

These grade cutoffs are firm at the end of the semester. No rounding or extra credit will be considered.

PowerPoint Slides/Lecture Notes

PowerPoint slides will be posted on Sakai prior to the beginning of each new chapter. Other miscellaneous items (exam answer keys, answer keys to select problems, Voice Over Videos) will be posted on Sakai as appropriate. It is the responsibility of the student to check Sakai regularly for new information.

Homework

On-line homework will be assigned through Pearson and will be due at 11:59 pm on the corresponding due date. Look on the Mastering Chemistry website (<https://mlm.pearson.com/enrollment/balija65861>) to determine the dates when the assignments will be due. The exact problems will be made visible at least one week prior to the due date. **No** extensions will be given. You are allowed to work others to complete the homework. However, remember that you will take the exam by yourself, so you must understand how to complete problems individually.

Suggested Problems on Syllabus

Additional textbook problems are listed at the end of the syllabus. These problems will not be graded. However, it is highly suggested that you solve these problems. You may work with others to solve suggested problems.

Electronic Devices

Cell phones and other mobile devices should be set to silent mode and placed away before class begins. Use of these devices in class may result in dismissal from lecture. Laptops and tablets are permitted for note-taking purposes only.

Changes to Syllabus

There may be changes to the syllabus during the semester. ***You are responsible for all syllabus changes made in class whether or not you attend. These updates will also be shared on the Sakai course page.***

Tentative CHEM 101 General Chemistry A Lecture Schedule*

Date	Chapter	Topic	Suggested Problems (not collected or graded)
1/17-1/19	1	Matter, Energy, and Measurement	<i>Chemical/Physical Change: 2, 19-22</i> <i>Significant Figures: 9, 10, 46-48, 51</i> <i>Physical/Chemical Properties: 26-28</i> <i>Units of Measurements: 31, 32</i> <i>Conversions: 33, 34, 53-58</i> <i>Density: 35, 36, 38</i> <i>Exact Numbers: 43, 44</i> <i>Significant Figure Calculations: 49, 50</i>
1/24-1/31	2/21	Atoms, Molecules, and Ions Nuclear Chemistry	Chapter 2 <i>Average Atomic Mass: 2, 35, 36, 39, 93, 95</i> <i>Protons, Neutrons, Electrons: 4, 23-31, 92</i> <i>Law of Multiple Proportions: 11, 13, 14</i> <i>Law of Conservation of Matter: 12</i> <i>Metal/Nonmetal: 41-43</i> <i>Ions: 55-58, 67, 68</i> <i>Ionic Compounds: 59-64, 69</i> <i>Nomenclature: 70-78, 107, 111-113</i> <i>Molecular/Ionic Compounds: 65, 66</i> Chapter 21 Protons, Neutrons, Electrons: 9, 10 Balanced Reactions: 13-16, 29-32
2/2-2/9	3	Chemical Reactions and Reaction Stoichiometry	<i>Balanced Reactions: 11-16, 21, 22, 87</i> <i>Patterns of Reactivity: 17-20</i> <i>Formula Weights: 23, 24</i> <i>Percentage by Mass: 25-27</i> <i>Mole Calculations: 35-43, 90</i> <i>Empirical Formula: 45-48, 95</i> <i>Molecular Formula: 51-55, 93</i> <i>Stoichiometry Calculations: 61-68</i> <i>Limiting Reagent Calculations: 77-86</i>
2/14-2/23	4	Reactions in Aqueous Solution	<i>Electrolytes: 16-20</i> <i>Solubility: 21-24</i> <i>Net Ionic Reactions: 25, 26, 39, 40</i> <i>Acids/Bases: 31, 32, 35</i> <i>Oxidation Numbers: 48-50</i> <i>Oxidized/Reduced: 51, 52</i> <i>Concentration Calculations: 60-62, 69-74</i> <i>Solution Stoichiometry: 10, 79-84, 87</i>
2/16		Exam I	Chapter 1, 2, 3, 21
2/28-3/14	5	Thermochemistry	ΔE : 25 <i>Work: 32</i> <i>Enthalpy: 43-48</i> <i>Heat Capacity/Specific Heat Capacity: 53, 55-60</i> <i>Hess's Law: 63-66</i> <i>Enthalpy of Formation: 69, 71-76, 78-80</i> <i>Bond Enthalpy: 81-84</i>

3/16-3/21	6	Electronic Structure of Atoms	<i>Electromagnetic Radiation: 17-20</i> <i>Energy and Photons: 25-28, 30</i> <i>Quantum Numbers: 55-62, 72, 93</i> <i>Electron Configuration: 75-80, 102 (Ch 7: 45, 46)</i>
3/23		Exam II	Chapters 4, 5, 6
3/28-3/30	7	Periodic Properties of the Elements	<i>Effective Nuclear Charge: 16-18</i> <i>Atomic/Ionic Radii: 25, 26, 28, 34</i> <i>Isoelectronic: 29, 31, 32</i> <i>Ionization Energies: 43, 44</i>
4/4-4/6	8	Basic Concepts of Chemical Bonding	<i>Lewis Symbols: 13-15</i> <i>Lewis Structures: 33-36, 47, 48, 63, 64</i> <i>Electronegativity: 39, 40</i> <i>Bond Polarity: 41, 42, 45, 46</i> <i>Formal Charges: 50-52, 90</i> <i>Resonance/Bond Length: 53-56, 66-68, 91</i> <i>Bond Strength: 69, 70</i>
4/11-4/18	9	Molecular Geometry and Bonding Theories	<i>VSEPR Model: 16, 17, 19-21</i> <i>Electron-Domain/Molecular Geometry: 23-28, 34</i> <i>Bond Angles: 29, 30</i> <i>Dipole Moment: 37, 39</i> <i>Polarity: 41, 42</i> <i>Hybrid Orbitals: 51, 52, 54</i> <i>Sigma/Pi Bonds: 57, 59-61, 64, 68</i>
4/20		Exam III	Chapters 7, 8, 9
4/25-4/27	10	Gases	<i>Conversions: 19-22</i> <i>Gas Law: 25, 26</i> <i>Calculations: 28</i> <i>Ideal Gas Law: 34, 38-44</i> <i>Non-Ideal Gas Behavior: 94</i>
5/3		FINAL EXAM (7:00 pm)	

*Subject to change as necessary