

General Chemistry 101 – Spring 2020

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Lecture M/W/F 8:15 - 9:05 a.m. Sullivan Center, Galvan Auditorium (Sect 009)

Discussion Mon 10:25-11:15 a.m. Flanner Hall – Room 7 (Sect 010)
 Mon 11:30-12:20 p.m. Flanner Hall – Room 7 (Sect 011)
 Mon 1:40-2:30 p.m. Flanner Hall – Room 7 (Sect 012)

Office Hours Tu: 12:30-2:00 p.m. & Fri: 10:00-11:30 a.m.

Required Text: Brown, LeMay, Bursten, Murphy, Woodward Chemistry-The Central Science 14th Ed.
 ISBN 978-0134414232

Required Online: ALEKS (login information can be found under the resources tab in Sakai)

1. Course Content & 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.

The student should learn how to:

1. 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. non-electrolyte).
2. 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.
3. Quantify relationships between variables controlling chemical systems.
4. Solve quantitative multistep problems combining multiple concepts within the systems.
5. Differentiate among closely related factors, categorize problem types, and select appropriate tools to solve these problems.
6. Apply chemical principles to explain natural phenomenon.

2. IDEA Objectives: Chosen by the faculty for General Chemistry; also apply across other courses and disciplines.

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

3. Quizzes, Exams, and Grading:

A total of six quizzes will be given throughout the semester. **No early quizzes, no make-ups, and no exceptions.** If you are more than 10 minutes late for the quiz, a late penalty will be deducted from your quiz score. Quizzes include exam-level problems and are to be completed in discussion, in small groups assigned by the instructor. Quiz work must reflect the efforts of ALL of the group members. The purpose of the quizzes is to foster cooperation and communication between students and the instructor, to help you learn the material. If you struggle with any part of a question in the group session, feel free to ask questions. I will do my best to help guide you towards the correct answer. Quizzes are worth 10% of your course grade. Your lowest quiz grade will be dropped. This grading policy is designed to account for an unavoidable absence (illness, emergency, broken down car, traffic, late CTA train, etc).

There are three 50-minute mid-term exams and one 2-hour final exam. The lowest of the three mid-term exams will be dropped. If you miss an hourly exam, than that is the exam that will be dropped. **No make-up mid-term exams will be given under any circumstances.** The final exam is cumulative and cannot be dropped. A calculator may be used on all exams and quizzes. However, all memory will be cleared from the calculator before each exam.

| | | |
|-------------------|------------|--|
| ALEKS | 15% | |
| Quizzes | 10% | (Best five out of six quizzes) |
| Mid-term exams | 40% | (Best two out of three mid-term exams) |
| <u>Final Exam</u> | <u>35%</u> | |
| TOTAL | 100% | |

You must bring a form of photo identification, such as your Loyola Student ID or your driver's license, with you to the exam. During exams, you will be required to leave your books, backpacks, notebooks, etc. at the front of the room. All exams are closed book and closed notes unless otherwise noted. When you are finished with your exam, please bring your completed exam to the front, and leave the room quietly without disturbing the other students.

Exams will be graded and returned to you as quickly as possible, usually by the following week. All grading questions, points of clarification, and grading errors must be brought to the instructor's attentions during office hours no later than one week after return of the exam.

The grading scale used to determine letter grades are as follows: **A** 100 – 93, **A-** 92 – 90, **B+** 89 – 87, **B** 86 – 81, **B-** 80 – 78, **C+** 77 – 75, **C** 74 – 69, **C-** 68 – 65, **D** 64 – 60, **F** < 60.

4. Exam Dates (subject to change):

| | |
|----------------------------|------------------------------------|
| Friday, February 14, 2020: | Mid-term Exam 1 |
| Friday, March 20, 2020: | Mid-term Exam 2 |
| Friday, April 17, 2020: | Mid-term Exam 3 |
| Thursday, April 30, 2020: | Final Exam, 9:00-11:00 a.m. |

5. *Quiz Dates (subject to change):*

| | |
|---------------------------|---------------|
| Monday, February 3, 2020 | Quiz 1 |
| Monday, February 17, 2020 | Quiz 2 |
| Monday, March 9, 2020 | Quiz 3 |
| Monday, March 23, 2020 | Quiz 4 |
| Monday, April 6, 2020 | Quiz 5 |
| Monday, April 20, 2020 | Quiz 6 |

6. *Final Exam*

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

Thursday, April 30, 2020, 9:00 – 11:00 a.m.

in Sullivan Center, Galvan Auditorium. You have exactly 2 hours to complete the exam. Additional time will not be granted, even if you arrive late. There will be no make-up final exams given under any circumstances, 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 exams scheduled for the same date may request to have one of those exams rescheduled. If a student reports having four (4) final examinations scheduled for the same date, students should be directed to e-mail a petition to Lester Manzano, Assistant Dean for Student Academic Affairs, CAS Dean's Office (lmanzano@luc.edu)

7. *ALEKS*

Online, at www.aleks.com, due MonWedFri at 11:59 p.m. as pre-lecture and post-lecture objectives. Assessments or "Knowledge Checks" are also automated into the system to help you remember course content throughout the entire semester. Chemistry is a complex and challenging subject, so I have chosen ALEKS to make sure you master the basic, fundamental concepts in the course to fully advance your personal educational and career goals. There is solid data that shows this service can improve mastery and retention, particularly for students who would otherwise have difficulty passing. ALEKS will help you by finding out YOUR individual state of knowledge, and then tutoring you in only the topics on which YOU need to work. The final outcome, the list of topics mastered, has been set for the course, and it is the same for everybody. But YOUR individual path, how you will get from the present state of mastery to that ultimate goal, is going to be unique to you. No other student will have exactly the same experience. What you must do is decide to trust the system when it assigns you work: trust that this is indeed the work you should be doing now, and that doing it diligently will build the essential mastery you need to succeed in chemistry as fast as possible. ALEKS is worth 15% of your Course Grade. The 15% is distributed as follows: 50% Intermediate Objectives, 5% Final Knowledge Check, and 45% Final Pie Mastery. You can find additional ALEKS info and tips on Sakai.

8. *Course Repeat Rule:*

Effective with the Fall 2017 semester, students are allowed only THREE (3) attempts to pass Chemistry courses with a C- or better grade. The three (3) attempts include withdrawals (W).

After the second attempt, the student must secure approval for the 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: <http://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.

9. Norms of Course Proceedings:

The classroom is to be a safe place to question and explore ideas. Student and teacher voices are important to this work. Collegial disagreement can be a healthy part of this process, but must always include respect for all members of the class.

Course activities will be designed to help students reach the goal of learning chemistry content and developing critical thinking skills. This will more often be driven by the use of data and reasoning to discover concepts and solutions rather than the identification and exchange of chemical facts and algorithms.

Students are expected to read individually on their own time outside of class.

Class sessions will begin and end on time. All students should attend class regularly and participate in class discussions. Absences could affect one's ability to learn chemistry during this session. Anticipated absences should be discussed with the instructor two class days before the absence. Proper documents may be requested to verify the reason for any absence. No make-up exams will be granted for any absence during an exam day, no matter what the excuse

10. *Sakai Materials:* Handouts given in class will be mirrored on Sakai.

11. Panopto and Recorded Lectures:

In this class software will be used to record live class discussions. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the Sakai course is unpublished (i.e. shortly after the course ends, per the Sakai administrative schedule: <https://www.luc.edu/itrs/sakai/sakaiadministrativeschedule/>). Students who prefer to participate via audio only will be allowed to disable their video camera so only audio will be captured. Please discuss this option with your instructor.

The use of all video recordings will be in keeping with the University Privacy Statement shown below:

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.

12. *Academic Honesty:*

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, that can be viewed at:

<http://www.luc.edu/cas/advising/academicintegritystatement/>

A basic mission of a university is to search for and 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 at Loyola University Chicago are expected to know, respect, and 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 and provided above) will be reported to The Chair of The Department of Chemistry & Biochemistry who will decide what the next steps may be. 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 the minimum of a "zero" on the item (this item cannot be dropped) and penalty up to failure of the course, as well as referral to the Dean's Office.

13. *Strategies and Suggestions:*

- The best method of learning chemistry is to work the assigned problems and write out the answers. *Then* check your answers versus the Answer Key.
- Study at least 10 hours per week and maintain a steady pace of studying. Chemistry continually builds, like a language, so studying some every day is most effective.
- Skim the current chapter before the corresponding lecture, so that you will be aware of the topics to be covered.

14. *Practices for Success:*

Supporting claims with evidence, making applications, solving and analyzing problems, and using chemical principles to explain phenomena are critical skills in the field of chemistry. The development of these skills is not without some frustration, but it carries the reward of deepening one's ability to think critically and solve problems in any field. The use of targeted, guiding questions, regularly scheduled work, and strategic study plans can greatly assist the learning of chemistry. With such a focus, hopefully any frustration will quickly turn to appreciation and fascination for the relevance and connectedness of chemistry in your life and within the world around you. Solving and analyzing problems is the most important feature of this work. If, at any time, you need assistance framing such plans for your work in chemistry, please do not hesitate to ask the instructor.

15. *Office Hours:*

My office door will be open per the times listed. Please use this time to if you have extra questions regarding this course. If you are unavailable to meet at the listed times, please feel free to email me with any questions. However, if you email me at night (after 6:00 p.m.), on weekends, or during holiday breaks I will respond to your email within 12 hours.

16. *Tutoring:*

The tutoring Center at the university offers free tutoring to students. To see the complete tutoring schedule and find additional information, visit the Tutoring Center webpage at www.luc.edu/tutoring

17. *Student Accommodations:*

If you have special needs, please let me know in the first week of classes. The University provides services for students with disabilities. Any student who would like to use any of these university services should contact the Student Accessibility Center (SAC), Sullivan Center, (773) 508-3700. Further information is available at: <http://www.luc.edu/sac/>

18. *Harassment (Bias Reporting):*

It is unacceptable and a violation of university policy to harass, discriminate against or abuse any person because of his or her race, color, national origin, gender, sexual orientation, disability, religion, age or any other characteristic protected by applicable law. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail for this university to fulfill its educational and health care mission. For this reason, every incident of harassment, discrimination or abuse undermines the aspirations and attacks the ideals of our community. The university qualifies these incidents as incidents of bias.

In order to uphold our mission of being Chicago's Jesuit Catholic University—a diverse community seeking God in all things and working to expand knowledge in the service of humanity through learning, justice and faith, any incident(s) of bias must be reported and appropriately addressed. Therefore, the Bias Response (BR) Team was created to assist members of the Loyola University Chicago community in bringing incidents of bias to the attention of the university. If you believe you are subject to such bias, you should notify the Bias Response Team at this link: <http://webapps.luc.edu/biasreporting/>

19. *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 receive any notes or other written information distributed in the missed class.

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 describing the reason for and the date of the absence.

This documentation must be signed by an appropriate faculty member or staff member, and it must be provided as far in advance of the absence as possible. 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. <http://www.luc.edu/athleteadvising/attendance.shtml>

20. *Accommodations for Religious Reasons*

If you have observance 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.

General Chemistry 101 Tentative Lecture Schedule (subject to change)

| | | |
|------|-----|---|
| 1-13 | 1 | Introduction: Matter and Measurement |
| 1-15 | 1 | Introduction: Matter and Measurement |
| 1-17 | 1/2 | Introduction: Matter and Measurement/Atoms, Molecules, and Ions |
| 1-20 | -- | <i>Martin Luther King Day (no class)</i> |
| 1-22 | 2 | Atoms, Molecules, and Ions |
| 1-24 | 2 | Atoms, Molecules, and Ions |
| 1-27 | 3 | Stoichiometry: Calculations with Chemical Formulas and Equations |
| 1-29 | 3 | Stoichiometry: Calculations with Chemical Formulas and Equations |
| 1-30 | 3 | Stoichiometry: Calculations with Chemical Formulas and Equations |
| 2-3 | 4 | Reactions in Aqueous Media |
| 2-5 | 4 | Reactions in Aqueous Media |
| 2-7 | 4 | Reactions in Aqueous Media |
| 2-10 | 4 | Reactions in Aqueous Media |
| 2-12 | 5 | Thermochemistry |
| 2-14 | -- | EXAM I (Chapters 1-4 or as announced) |
| 2-17 | 5 | Thermochemistry |
| 2-19 | 5 | Thermochemistry |
| 2-21 | 5 | Thermochemistry |
| 2-24 | 6 | Electronic Structures of Atoms |
| 2-26 | 6 | Electronic Structures of Atoms |
| 2-28 | 6 | Electronic Structures of Atoms |
| 3-2 | -- | <i>Spring Break 2020!</i> |
| 3-4 | -- | <i>Spring Break 2020!</i> |
| 3-6 | -- | <i>Spring Break 2020!</i> |
| 3-9 | 21 | Nuclear Chemistry |
| 3-11 | 21 | Nuclear Chemistry |
| 3-13 | 21 | Nuclear Chemistry |
| 3-16 | 7 | Periodic Properties of the Elements |
| 3-18 | 7 | Periodic Properties of the Elements |
| 3-20 | -- | EXAM II (Chapters 5-7 or as announced) |
| 3-23 | 7 | Periodic Properties of the Elements |
| 3-25 | 8 | Basic Concepts of Chemical Bonding |
| 3-27 | 8 | Basic Concepts of Chemical Bonding |
| 3-30 | 8 | Basic Concepts of Chemical Bonding |
| 4-1 | 9 | Molecular Geometry and Bonding Theories |
| 4-3 | 9 | Molecular Geometry and Bonding Theories |
| 4-6 | 9 | Molecular Geometry and Bonding Theories |
| 4-8 | 9 | Molecular Geometry and Bonding Theories |
| 4-10 | -- | <i>Easter Break</i> |
| 4-13 | -- | <i>Easter Break</i> |
| 4-15 | 10 | Gases |
| 4-17 | -- | EXAM III (Chapters 21 & 8-9 or as announced) |
| 4-20 | 10 | Gases |
| 4-22 | 10 | Gases |
| 4-24 | 10 | Gases |
| 4-30 | -- | Cumulative Final Exam, Sullivan Center-Galvin Auditorium Thursday, April 30, 9:00-11:00 a.m. |