



## **Chem 105aLg: General Chemistry (4.0 Units)**

**Fall 2023**

### **GENERAL INFORMATION**

**Class Meetings:** Lecture - MWF 11-11:50 am in SGM 123

Quiz – Thursday 3:30 – 4:50 pm

### **COURSE PERSONNEL**

**Instructor:** Professor Rebecca M. Broyer

**Office Hours:** Mondays 1pm-2pm and Wednesdays 12pm-1pm in SGM 307

**Contact Info:** rebecca.broyer@usc.edu (preferred contact method)

**Lab Instructor:** Dr. Catherine Skibo

**Office Hours:** See laboratory Blackboard site for times / meeting information

**Contact Info:** (213) 740-8265, skibo@usc.edu

**Course Coordinator:** Paperwork may emailed as a PDF

**Contact Info:** [coord105@usc.edu](mailto:coord105@usc.edu)

**Teaching assistant contact information and office hours times/location can be found on the course Blackboard site.**

### **Supplemental Instruction (SI)**

The University has a Supplemental Instruction Program (<https://dornsife.usc.edu/chem105a/>) that we encourage you to use. The SI instructors hold weekly sessions going over the course material and problems. They also prepare mock exams, which you can use to test yourself before the midterms and finals. The SI leaders attend all of the lectures and are familiar with the lecture material.

### **COURSE DESCRIPTION**

The purpose of CHEM 105a is to introduce the basic chemical principles that underlie all molecular sciences (from materials and nanoscience to medicine and the machinery of biology). It will introduce good lab practice and how to make decisions based on sound data. Topics covered include the structure and underlying principles of the periodic table, chemical bonding, reaction stoichiometry, properties of solutions and gases, and thermochemistry. After this course students will be both better prepared for continuing studies and understand molecular principles relevant to everyday life

## LEARNING OBJECTIVES

Students who successfully complete CHEM 105a will be able to:

- Explain the chemical and physical behavior of matter based on modern atomic theory, quantum mechanics, and the resulting atomic periodicity.
- Describe the formation and energetics of chemical bonds based on electrostatic forces.
- Describe and predict the structure of covalent and ionic compounds.
- Explain the properties of chemical molecules using bonding models, including hybridization and molecular orbital theory, with the understanding of their limitations.
- Describe the physical and chemical changes taking place in chemical reactions at both the particulate and macroscopic levels.
- Recognize and classify acid-base, precipitation, and oxidation-reduction reactions.
- Use balanced chemical equations to determine quantities of reactants and products.
- Explain the behavior of gas phase chemical systems at the particulate and macroscopic level using ideal gas behavior.
- Explain the First and Second Laws of Thermodynamics in relation to chemical systems.
- Describe the energetics of a chemical system using the state function enthalpy.
- Explain macroscopic properties based on intermolecular forces within the chemical system.
- Describe the structure and properties of the liquid and solid states, as well as phase changes, at the particulate and macroscopic levels.
- Explain the chemical, physical, and thermodynamic properties of solutions at the particulate and macroscopic level.
- Clearly define a problem and develop solutions for that problem including the use of central and auxiliary equations and conversion factors.
- Apply the concepts listed above to explain and interpret empirical observations, particularly in the laboratory portion of the course.
- Prepare laboratory reports that include experimental procedures, data analysis, and scientific writing.

## COURSE MATERIALS

### Required

Textbook: Chemistry: A Molecular Approach (5th edition) by Tro (package available in USC Bookstore includes for free the eText and Mastering Chemistry (MC not required); also available on Amazon).

Lab Manual: Chem 105a Laboratory Manual (purchasing information available once course begins)

100% Cotton Lab Coat and Safety Glasses or Goggles

### Optional

Solutions Manual for textbook

## DESCRIPTION AND ASSESSMENT OF ASSIGNMENTS

**Guided Reading Notes:** Prior to coming to class each day you will complete guided reading notes and a few short problems to prepare for class. Reading from the textbook and short videos are provided to help you prepare the guided reading notes. The guided reading notes need to be completed and uploaded to Gradescope by 10:45 each morning before class starts. Guided reading notes are graded on completion. Each guided reading notes assignment is worth 3 points. The highest 30 scores will count toward the total. **No late submissions will be accepted.**

**Weekly Practice:** Every week there will be five activities that count toward weekly practice. Each activity is described below. You are responsible for completing three of the five activities every week for your weekly practice score. **No late submissions will be accepted for any activities.**

*In Class Worksheets* – each class period a worksheet will be completed during class to keep students engaged and participating in the class work. Worksheets will be submitted by the end of the class period (11:50 am) in Gradescope.

*Practice* – In weeks that there is no scheduled quiz, there will be a practice quiz or activity related to lecture on material from the week before. Students can work in groups to complete the task during the first 45 minutes of the quiz period. There will be a debrief of the material with an instructor during the last 35 minutes of the quiz period. Submissions will be made to Gradescope by 4:30 pm during the quiz period.

*Quiz Reflection* – On weeks that there is a scheduled quiz, a reflection worksheet will be available that will be uploaded to Gradescope by noon the Sunday following the quiz.

*Study Tool Reflection* – Each week a study tool will be introduced. Try the study tool and answer the reflection questions posted with the tool. Responses will be uploaded to Gradescope by 2 pm on Fridays.

*Extra Practice* – On weeks when there are not three class periods, extra practice worksheets will be posted. Responses will be uploaded to Gradescope by 2 pm on Fridays of weeks that there are fewer than three class periods.

**Weekly Homework:** Each week there will be a homework assignment. You will upload a copy of your answers to Gradescope by Wednesday at 1 pm the following week. Homework assignments are graded on accuracy. The highest 12 scores will count toward the total. **No late submissions will be accepted.**

**Quizzes:** There will be four quizzes during the semester and a cumulative quiz worth two quizzes. These will test your understanding of the material covered in the class up until that point. Quizzes will be held during the weekly quiz section (**Thursdays at 3:30 pm, quiz dates are: 9/14, 10/5, 10/26, 11/16**). No make-up quizzes will be given. **If you are sick or experiencing an emergency contact the Course Coordinator.**

**Cumulative Quiz:** There will be a cumulative quiz given during finals week it is scheduled by the University for Thursday 12/7 from 8 to 10 am. The cumulative quiz covers all material from the semester. The cumulative quiz cannot be taken at another time, if you are not able to take the quiz on the scheduled date, you should take Chem 105a in another semester.

### Grading Breakdown

Your grade will be determined according to the following distribution:

Guided Reading Notes (30) 3 points each	90 points
Weekly Practice (15) 6 points each	90 points
Weekly Homework (12) 10 points each	120 points
Quizzes (4) 60 points each	240 points
Laboratory	340 points
Cumulative Quiz	120 points

To receive a passing grade, satisfactory work must be done in **both** lab and the lecture portions of the course. The lab material will be available through a separate Blackboard page and any questions about the lab should be directed to Dr. Skibo the lab director. You are encouraged to check your grades on the Chem 105a Blackboard.

### Grading Scale

Course final grades will be determined using the following scale:

Grade	(%)	Points
A	93-100	930 - 1000
A-	90-92.9	900 - 929
B+	87-89.9	870 - 899
B	83-86.9	830 - 869
B-	80-82.9	800 - 829
C+	77-79.9	770 - 799
C	73-76.9	730 - 769
C-	70-72.9	700 - 729
D+	67-69.9	670 - 699
D	63-66.9	630 - 669
D-	60-62.9	600 - 629
F	Below 60%	0 - 599

We do our best to inform you on your progress in the course by assigning an approximate letter grade at the end of the second week. This is based on your performance in the course to date. Note: this advisory letter is no guarantee of your final grade. Final grades are assigned using the grading scale, above. You are encouraged to check your scores often in Blackboard.

## OTHER COURSE INFORMATION

### Gradescope

Graded materials will be scanned and available for viewing/printing from Gradescope. <http://www.gradescope.com>. You will be sent an invitation from the instructor of the course. Details can be found on Blackboard

### Course Notes

Lecture notes will be available on Blackboard.

### Office Hours

You are strongly encouraged to attend office hours for your TAs. Details on office hours will be posted in the course Blackboard page.

### Grading Timeline

Most classwork assignments will be graded within 24 hours of submission. Graded labs will be returned one week after they are submitted. You can view your grades at any time on the Blackboard site.

### Course evaluation

Students will submit confidential course evaluations, available online during week 13. More information will be provided in lecture.

The instructor reserves all rights to change any of the contents within the syllabus with advanced notice if any changes become necessary during the semester.

### Chem 105a Fall 2023 Schedule

Week	Date	Chapter Sections
1	Mon 8/21	Syllabus and Course Structure
	Wed 8/23	Chapter 1: 1.1 – 1.6
	Thurs 8/24	<i>Practice 1</i>
	Fri 8/25	Chapter 1: 1.7 – 1.9
2	Mon 8/28	Chapter 2: 2.1 – 2.7
	Wed 8/30	Chapter 2: 2.8 – 2.9
	Thurs 8/31	<i>Practice 2</i>
	Fri 9/1	Chapter 3: 3.1 – 3.7
3	Mon 9/4	<i>Labor Day – No Classes</i>

	Wed 9/6	Chapter 3: 3.8 – 3.10
	Thurs 9/7	<i>Practice 3</i>
	Fri 9/8	Chapter 4: 4.1 – 4.4
4	Mon 9/11	Chapter 4: 4.4 – 4.5
	Wed 9/13	Chapter 5: 5.1 – 5.6
	Thurs 9/14	<b>Quiz 1</b>
	Fri 9/15	Chapter 5: 5.7 – 5.9
5	Mon 9/18	Chapter 6: 6.1 – 6.4
	Wed 9/20	Chapter 6: 6.5 – 6.7
	Thurs 9/21	<i>Practice 4</i>
	Fri 9/22	Chapter 6: 6.8 – 6.9
6	Mon 9/25	Chapter 6: 6.10
	Wed 9/27	Chapter 7: 7.1 – 7.5
	Thurs 9/28	<i>Practice 5</i>
	Fri 9/29	Chapter 7: 7.6 – 7.7
7	Mon 10/2	Chapter 7: 7.8 – 7.9
	Wed 10/4	Chapter 8: 8.1 – 8.4
	Thurs 10/5	<b>Quiz 2</b>
	Fri 10/6	Chapter 8: 8.5 – 8.6
8	Mon 10/9	Chapter 9: 9.1 – 9.4
	Wed 10/11	Chapter 9: 9.5 – 9.9
	Thurs 10/12	<i>Fall Recess – No Classes</i>
	Fri 10/13	<i>Fall Recess – No Classes</i>
9	Mon 10/16	Chapter 10: 10.1 – 10.4
	Wed 10/18	Chapter 10: 10.5
	Thurs 10/19	<i>Practice 6</i>
	Fri 10/20	Chapter 10: 10.6
10	Mon 10/23	Chapter 10: 10.10
	Wed 10/25	Chapter 11: 11.1 – 11.4
	Thurs 10/26	<b>Quiz 3</b>

	Fri 10/27	Chapter 11: 11.5
11	Mon 10/30	Chapter 11: 11.6 – 11.7
	Wed 11/1	Chapter 11: 11.8
	Thurs 11/2	<i>Practice 7</i>
	Fri 11/3	Chapter 12: 12.1 – 12.4
	Mon 11/6	Chapter 12: 12.5 – 12.7
12	Wed 11/8	Chapter 12: 12.8 – 12.9
	Thurs 11/9	<i>Practice 8</i>
	Fri 11/10	<i>Veteran's Day – No Classes</i>
	Mon 11/13	Chapter 14: 14.1 – 14.4
13	Wed 11/15	Chapter 14: 14.5 – 14.6
	Thurs 11/16	<b>Quiz 4</b>
	Fri 11/17	Chapter 14: 14.7 – 14.8
	Mon 11/20	Q&A
14	Wed 11/22	<i>Thanksgiving – No Classes</i>
	Thurs 11/23	<i>Thanksgiving – No Classes</i>
	Fri 11/24	<i>Thanksgiving – No Classes</i>
	Mon 11/27	Review
15	Wed 11/29	Review
	Thurs 11/30	<b>Lab Quiz</b>
	Fri 12/1	Review

Final Exam: Thursday 12/7 8 – 10 am

## **STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS**

### **Academic Integrity:**

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.



The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

**AI Policy:**

Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated tools is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

**Students and Disability Accommodations:**

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at [osas.usc.edu](https://osas.usc.edu). You may contact OSAS at (213) 740-0776 or via email at [osasfrontdesk@usc.edu](mailto:osasfrontdesk@usc.edu).

**Support Systems:**

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or [otfp@med.usc.edu](mailto:otfp@med.usc.edu)

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.