



# USC University of Southern California

**Chem 105aLg: General Chemistry (4.0 Units)**  
**Fall 2020**

**Class Meetings:** MWF at 9, 10 or 11am

**Location:** This class is 100% online only. Synchronous class meetings will be held via Zoom, however recorded lectures will be posted on Blackboard to be viewed asynchronously.

Lecturer	Lecturer	Lab Coordinator	Course Coordinator
Prof. Oleg Prezhdo <a href="mailto:prezhdo@usc.edu">prezhdo@usc.edu</a>	Prof. Smaranda Marinescu <a href="mailto:smarines@usc.edu">smarines@usc.edu</a>	Dr. Catherine Skibo	Paperwork for the Course Coordinator may be emailed as a PDF.
Office hours: M 1-3pm, W 2-4pm, held via Zoom Additional appointments may be requested by email Prof. Prezhdo Aug 17 - Sept 17; Prof. Marinescu starting Sept 18, hours TBA		<a href="mailto:skibo@usc.edu">skibo@usc.edu</a> Office hours: M, W 1:30-3pm appointments may be requested by email, held via Zoom	<a href="mailto:coord105@chemmail.usc.edu">coord105@chemmail.usc.edu</a> Office hours: appointments may be requested by email, held via Zoom

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

## Course Description

The purpose of CHEM 105a is to introduce the basic chemical principles that underlie all of the 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 have an understanding of molecular principles relevant to everyday life.

## Learning Objectives

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

- 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 chemical, physical, and thermodynamic properties of solutions at the particulate and macroscopic level.
- 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 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.

- 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.

## Required Materials

Chemistry: A Molecular Approach (5th edition) by Tro. Printed text package available from USC Bookstore includes the eText for free and Mastering Chemistry (MC not required).

Chem 105b Laboratory Manual (available for purchase through instructions on Blackboard)

Calculator: a nonprogrammable calculator is required for exams

An internet-enabled device and internet access are required for exams, and viewing and attending lectures.

A webcam on a tablet or computer/laptop is required for every exam.

**If you do not have Internet access and a webcam, acquire both or drop this class immediately.**

## Optional Materials

Solutions Manual for textbook

Calculations in Chemistry (2<sup>nd</sup> Edition) by Dahm (optional, recommended for students who desire additional practice with critical math and chemistry skills)

## Description and Assessment of Assignments

Assignments in the course include exams, quizzes, lab exit tickets, laboratory reports, and laboratory quizzes.

## Grading Breakdown

Your grade will be determined according to the following distribution:

Assignment	Points	% of Grade
Exam 1	120	13%
Exam 2	120	13%
Exam 3	120	13%
Pre-Lecture Quizzes	45	5%
Laboratory	290	31%
Final Exam	240	26%
<b>TOTAL</b>	<b>935</b>	<b>100%</b>

**To receive a passing grade, 60% of course points must be earned, and satisfactory work must be done in both lab and the lab portion of the course.** Students who score <561 points (<60%) will receive an F. You are encouraged to check your grades on the course Blackboard site.

## Grading Scale

Course final grades will be determined using the following scale:

Grade	Points	%	Grade	Points	%
A	869.00-935	93-100	C	682.00-719	73-76.9
A-	841.00-868	90-92.9	C-	654.00-681	70-72.9
B+	813.00-840	87-89.9	D+	626.00-653	67-69.9
B	776.00-812	83-86.9	D	589.00-625	63-66.9
B-	748.00-775	80-82.9	D-	561.00-588	60-62.9
C+	720.00-747	77-79.9	F	Below 561	Below 60%

**Midterm grade:** We do our best to inform you on your progress in the course by assigning an approximate letter grade at the end of the ninth 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.

## Course Notes

Lecture slides are available on Blackboard under "Content" then "Lecture Slides".

## Office Hours

You are strongly encouraged to see any TA during their office hours, not just your own. Office hours (via Zoom) for all TAs will be posted on the course Blackboard site.

## Exams

There will be three midterms and a final. No make-up exams will be given. An *unexcused* missed hour exam will be counted as a zero toward your final grade. The comprehensive **final exam will be given 4:30-6:30pm on Thursday, November 19, 2020**. **Note: this is not the standard time for final exams for the MWF 9, 10 or 11am lectures**. This is the only time during which the final exam may be taken; there are no make-ups. Absences on the final exam do not automatically qualify for a grade of incomplete. **If you cannot take the exams and final during their designated times, do not not take this course.**

## Respondus

Exams are taken with Respondus, an online proctoring system in which you are monitored using your webcam. **If you do not have Internet access and a webcam, acquire both or drop this class immediately.** Respondus flags irregular eye movement and activity and sends a report of suspicious activity; if you engage in any unusual behavior, the recording will be submitted to SJACS. During the exam, you may only use your cell phone 1) to display the time; or 2) to email the professor questions during the exam (the time your email is received must match your recorded use of your cell on Respondus). **Instructions to download and use Respondus are here:**

<https://blackboardhelp.usc.edu/respondus-lockdown-browser/>

## Regrades

Submit regrades before the deadlines (see p5) to the professor by email; under no circumstances will late regrades be accepted. NOTE: A regrade request is a request to have your entire exam graded more carefully. Your entire exam will be regraded and **your score may go down.**

## Exam Absences

There are no make-up exams. Exam absences must be supported by official documentation (given to the Course Coordinator) to be excused. **For emergency, email the Course Coordinator [coord105@chemmail.usc.edu](mailto:coord105@chemmail.usc.edu) (include your phone number) on the morning of the absence (or prior).** For excused absences, the missed exam is scored as weighted average of their other 2 midterm exam scores  $[(\text{sum of student's other 2 exam scores})/(\text{sum of those class averages}) * (\text{class average of excused exam})]$ . If you cannot take at least two of the midterm exams, you will receive a score of zero for the second missed exam. **Students must take at least two of the three midterms AND the final.**

## 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.

## Assignment Submission Policy

Laboratory reports are due at the beginning of your lab period one week after completing the lab exercise. Pre-lab exercises are due at the beginning of the relevant lab period.

## Grading Timeline

Graded labs will be returned one week after they are submitted. All other graded work will be available for review on Blackboard within 48 hours of the due date. You can view your grades at any time on the Blackboard site.

## Pre-Lecture Quizzes

Prior to lecture you will be asked to watch short videos and complete a related quiz (or quizzes) on Blackboard. These videos and their quizzes will help you assess your understanding of the material. There are approximately 50 videos throughout the semester. You will earn 1 point for answering each quiz correctly, with 5 attempts allowed. Your top 45 scores will count toward your final grade. You will not earn points for submitting answers after the deadline. Please carefully note all due dates and times (found in Blackboard). There are no make-ups and no late submissions.

## Homework

It is recommended that students spend a total of 6-9 hours per week outside of class on Chem 105a-related work. Recommended end-of-chapter problems and additional practice problems will be posted on the course Blackboard site under Assignments. These items will not be graded, but students are expected to do them. Answers can be checked with the solutions manual, and in TA and instructor office hours.

## Laboratory

**Laboratory Orientation:** A Lab orientation module will be posted to the laboratory Blackboard site. You must complete the lab orientation in order to maintain your space in the lab and thus to remain in the course.

**Quiz Period/Lab Lecture:** There will be 30-minute lab lectures posted each week. Please review them prior to your lab time. A schedule of the lab lecture topics will be posted on the Chem 105a Laboratory page on Blackboard.

**Lab Scores:** See Blackboard for lab scores and informational material.

**Lab Exam:** There will be two lab quizzes covering material from lab throughout the semester. Questions typically cover the procedure, safety issues, relevant chemical formulas and chemical equations, observations, calculations, and data analysis.

**Lab Attendance:** *This is a laboratory course and attendance to all virtual lab periods is mandatory. All labs must be completed to pass the course.* For lab absences, email Dr. Skibo (skibo@usc.edu) as soon as possible in order to arrange a make-up lab. You must arrive on time and prepared for lab. If you show up more than 10 minutes late, you will not be admitted to the lab session. Before leaving lab, you must submit your exit ticket(s). Satisfactory completion of all labs and lab work is required to pass the class. Additional laboratory policies can be found in the lab syllabus.

**Late work:** Unless otherwise directed by Dr. Skibo, all lab reports are due the following week. The lab calendar on the 105a lab page shows due dates for all assignments. ALL assignments must be submitted by November 13. Assignments received more than 9 days late will receive a maximum score of up to 5 points for the pre-lab assignment. The rest of the report will be evaluated as Pass or No Pass. All lab assignments will be submitted through the Chem 105a Lab Blackboard page. Please review your TA's feedback promptly. Regrades on laboratory reports must be requested within one week of when the lab report is graded.

## Classroom norms

Listen actively and attentively.

Be courteous. Don't interrupt or engage in private conversations while others are speaking.

Use Zoom chat box to ask for clarification if you are confused.

## Academic Integrity

All work submitted in this course must be your original work. You may not use outside sources for answers to assignments (for example, exams, pre-lab questions, lab reports, quiz questions, etc.). While you may collaborate with others on laboratory work, all work must be in your own words and reflect your good-faith efforts. It is never acceptable to use outside "tutors" or others to furnish answers for you. Please familiarize yourself with the discussion of plagiarism and other forms of academic dishonesty in SCampus in Part B, Section 11, "Behavior Violating University Standards" [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

## Course evaluation

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

## Topics Covered in Chem 105a

Chapter	Contents
1.3 - 1.9	Matter and Measurement
2.5 - 2.9	Atoms and Elements
3.2 - 3.10	Molecules and Compounds
4.2 - 4.4	Stoichiometry
5.2 - 5.7, 5.9	Aqueous Reactions
6.2 - 6.10	Gases
7.2 - 7.9	Thermochemistry

Chapter	Contents
8.2 - 8.6	Quantum-Mechanical Model
9.2 - 9.9	Periodic Trends
10.2 - 10.10	Chemical Bonding I
11.2 - 11.8	Chemical Bonding II
12.2 - 12.3, 12.5 - 12.8	Liquids and Solids
14.2, 14.5 - 14.7	Solutions

### ***Important Dates to Remember***

August 17 (M)	First Day of Classes	
Sept 04 (F)	Last day to drop <u>without a "W" to avoid tuition charges</u>	
Sept 07 (M)	Labor Day, No Classes	
<b>Sept 10 (Th)</b>	<b>First Hour Exam</b>	Regrade deadline: 5pm Mon Sept 14
Oct 02 (F)	Last day to drop <u>without a "W" but still incurring tuition charges for this class</u>	
<b>Oct 08 (Th)</b>	<b>Second Hour Exam</b>	Regrade deadline: 5pm Mon Oct 12
Oct 16 (F)	Midterm Grade Assigned	
<b>Nov 05 (Th)</b>	<b>Third Hour Exam</b>	Regrade deadline: 5pm Mon Nov 09
Nov 06 (F)	Last day to drop <u>with a "W"</u>	
Nov 13 (F)	Last Day of Class	
<b>Nov 19 (Th)</b>	<b>Final Exam 4:30 – 6:30 p.m.</b>	Regrade deadline: (12 noon Mon Nov 23)

**If you cannot take the exams and final during the times listed, do not take this course. This is the only time during which the final exam may be taken. No make-ups.**

**If you do not have Internet access and a webcam, acquire both or drop this class immediately.**

## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](https://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](https://policy.usc.edu/scientific-misconduct).

### Support Systems:

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

[studenthealth.usc.edu/counseling](https://studenthealth.usc.edu/counseling)

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

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](https://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](https://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](https://equity.usc.edu), [titleix.usc.edu](https://titleix.usc.edu)

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. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](https://usc-advocate.symplicity.com/care_report)

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

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](https://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

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

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

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*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

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) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.