

De Anza College-Winter 2024 (1/8-3/29)
Chemistry 1B General Chemistry CHEM 1B Section 66

Lecture TR – 6: 00 PM to 7:15PM – G6

Lab TR – 7:30 PM to 10:20 PM – SC2204

Instructor: Dr. Jie Liang, email: kikliang0213@gmail.com

Office Hours: Mondays 7:30 PM – 8:30 PM through Zoom: 723 652 7170

Description: This class will cover the principals of chemical kinetics, intermolecular forces, gases, chemical equilibrium, weak acids/bases, and thermodynamics. This course is divided into two separate instructional periods, the lecture and laboratory sections. Lecture and lab sections must be taken together to pass Chem 1B and will both go towards a single grade.

Course Material:

1. **Primary Lecture Text:** OPEN STAX Chemistry, Second Edition: <https://openstax.org/details/books/chemistry-2e>. This is a free, online textbook and we will follow chapters 9, 10, 12-14, and 16 in this course.

2. **Aktiv Online Homework Platform:** We will use the online platform Aktiv for homework. An instruction is posted on Canvas.

3. **Lab Equipment:** There are a few things needed to safely complete the experiments.

- Goggles are required for the entire lab, in addition to appropriate clothing for lab work, long pants, sleeved shirts, and closed toe shoes.
- A lab notebook will also be needed. This notebook cannot be pocket size and must be permanently bound, so no recording information on lose papers.
- Disposable Nitrile Gloves.
- Lab Manuel: <https://www.deanza.edu/chemistry/Chem1B.html>

4. **Scientific Calculator.** Logarithm and exponential functions required. You are encouraged to bring your calculator each day to work through examples as they are presented. Phones will not be allowed for calculations during tests.

5. **Computer and printer access.**

Class Registration: Registration limit is strictly set at 30 per section since we are limited by the space in lab. Students on this waitlist may attend the lecture within the first two weeks but will not be allowed to come to lab until officially enrolled due to space restrictions. Since those on the waitlist will not be able to access the class canvas page, I will email lecture notes and assignments until registration is finalized at the end of the second week.

Resource: Information about tutoring can be found at the Math Science and Technology Resource Center: <https://www.deanza.edu/studentsuccess/mstrc/>

Academic Integrity: By enrolling in classes at De Anza College, you are agreeing to the academic integrity policy and are held to all standards. Specifics can be found at <https://www.deanza.edu/studenthandbook/academic-integrity.html>.

Cheating during an exam/quiz or copying/using work other than your own for assignments will result in a 0 for the entire assignment, regardless of what percentage of the work is from cheating.

Worse than a 0 on an exam, I am required to report such incidents to the disciplinary committee, who will make a note of the incident on your transcript, which then becomes visible to 4-year colleges upon reviewing your transfer application.

Disability Service Support: Please contact me as soon as possible if you require special accommodations and I will be happy to do what I can to help. For more information, visit Disability Service Support at <https://www.deanza.edu/dss/>

Late Work Policy: Late prelabs are not accepted since preparation for safe lab work is mandatory. Other late work is accepted if it is submitted within 2 business days after due day, but that assignment will be worth half credit maximum.

Lecture

1. Keep quiet. We are adults. However, you are encouraged to raise your hands and ask questions if you have any.
2. I will post my notes in Canvas, so do not be panic if you do not have time to copy all of them. However, try your best. The way I organize my notes may not fit you. Also, taking notes can help you focus.
3. Complete all homework problems because I will use some on exams.

Lecture assignments:

Homework. Homework assignments are worth 10% of the overall grade and are given through the online platform Aktiv. Scoring is on completion. Unlimited attempts. The difficulty of exam would be at the same level or a little bit easier than homework.

Lecture Quizzes. Quizzes will be given between the exams to make sure everyone is keeping up with the material throughout the quarter. The quizzes are worth **30 points** each, will take about 25 minutes.

Lecture Exams. There will be three lecture exams throughout the quarter. Exams will cover material from lectures (concepts and calculation examples) and homework from Aktiv. If one of

three exams is missed, this exam will be scored the same as the lowest score of the other two exam.

Lecture Final. The lecture final is worth **150 points** and will cover all chapters but will have more from the later chapter 14 and 16 since there will not yet have been any testing on those chapters.

Lab

Lab Safety/Preparedness:

Safety goggles, long pants, sleeved shirts, and closed-toe shoes, gloves, prelab.

Absence Policy

If you are feeling sick before coming to lab, please, stay home. You are allowed to miss two lab periods, and there will be a way for you to make up the points.

Lab Assignments:

There is a total of 7 lab experiment this quarter that will loosely correspond to the topics we are covering in lecture.

Prelab (usually due at the first day of a new lab experiment at 5:00 pm):

The first part of the prelab is the **lab introduction**, where you will describe the goals of the experiment, introduce the scientific principles that form the basis of the study, and summarize the process by which you obtain the experimental data in your own words. (3 paragraphs)

The second part is a recognition of the **hazards** associated with each chemical in the procedure. This does not need to be everything on the SDS but should convey the hazards of working with that chemical and the proper precautions for safe usage. (1 or 2 sentence)

The third part of the prelab is to fill out data and calculation **tables** using your reasonable assumption (hard part).

All parts of the prelab must be completed before coming to lab. Scan/take pictures of the work and upload them to the appropriate CANVAS assignment.

Data (usually due at the last day of a lab experiment at 11:59 pm): You will not be graded on how accurate or precise your data are, but rather that all the trials are complete, and the appropriate number of figures are recorded for each measurement.

Calculation and Conclusion (usually due at the following Monday after completion of a lab experiment): If you want to leave early, you need to finish calculation. For the conclusion: present the final values that directly relate to the experimental goal. Additionally, compare one trial to the next and/or compare the average value to literature values.

Provide a source of error that may have resulted in differences between trials or between experimental averages and accepted values. Explain how an error could have affected your result by following this error through the calculation process from data collection to final result.

Formal Laboratory Report. For the indicator experiment, you will do a formal, typed report worth **55 points** that will contain all parts of the lab together in one document.

In scientific research, conveying what you have discovered in a clear, concise manner is essential to making your new ideas accessible to others and allowing your contributions to help the world.

It may feel like something completely new if you have not done a scientific report, and that is okay. We will not be doing everything that a manuscript would require but rather looking to gain familiarity with presenting an experimental study. I will provide an instruction sheet to help with the structure of this report.

Lab Final. The lab final will test your understanding of the theories utilized in lab this quarter as well as the calculations implemented to yield results from the raw data. This exam will be during your lab time during the last week of class and is worth **100 points**. You will be allowed to use any notes you have taken throughout the entire quarter during this test, so it is beneficial to organize your work. No early or late exams will be allowed. No working with chemicals is required.

Grade: This rubric is subject to change throughout the quarter.

A+ >97 A 97-93 A- 93-90 B+ 90-87 B 87-83 B- 83-80 C+ 80-76 C 76-70 D 70-60 F <60

Lecture assignment	Points
Homework	120
Quiz 1	30
Quiz 2	30
Exam 1	100
Exam 2	100
Exam 3	100
Worksheet (s)	10
Final Exam	150
Lecture Total	640

Lab assignment	Points
Chemical Lab Safety Quiz	5
Molar Volume of a Gas Prelab	8
Molar Volume of a Gas Experimental Data	5
Molar Volume of a Gas Calculations and Questions	8
Molar Volume of a Gas Conclusion	5
Enthalpy of Vaporization Prelab	8
Enthalpy of Vaporization Data	5
Enthalpy of Vaporization Calculation	8
Enthalpy of Vaporization Conclusion	5
Green Crystal Prelab	10
Green Crystal Data	8
Green Crystal Calculations and Questions	10
Green Crystal Conclusion	8
Indicator Prelab	8
Indicator Data	5
Indicator Calculation and Question	8
Indicator Conclusion	5
Kc Prelab	8
Kc Data	5
Kc Calculation and Question	8
Kc Conclusion	5
Ka/Kb Prelab	8
Ka/Kb Data	5
Ka/Kb Calculation and Question	8
Ka/Kb Conclusion	5
Calcium Hydroxide Prelab	8
Calcium Hydroxide Data	5
Calcium Hydroxide Calculation and Question	8
Calcium Hydroxide Conclusion	5
Lab Report for Indicator	55
Lab Final	100
Check-out	8
Lab Total	360

Day	Date	Lecture	Lab
1/9/24	T	Chapter 9	Check-in
1/11/24	R	Chapter 9	Exp B1: Molar Volume of a Gas + Safety Quiz
1/16/24	T	Chapter 9 &10	Exp B1
1/18/24	R	Chapter 10	Exp B2: Enthalpy of Vaporization
1/23/24	T	Chapter 10 + Quiz 1	Exp B2
1/25/24	R	Chapter 10	Exp B7: Green Crystal
1/30/24	T	Chapter 12	Exp B7
2/1/24	R	Chapter 12	Exp B7
2/6/24	T	Exam 1 (Chapter 9&10)	Exp B7
2/8/24	R	Chapter 12	Exp B7
2/13/24	T	Chapter 12	Exp B6: Indicator
2/15/24	R	Exam 2 (Chapter 12)	Exp B6
2/20/24	T	Chapter 13	Exp B6
2/22/24	R	Chapter 13	Exp B6
2/27/24	T	Chapter 14	Exp B4: Kc
2/29/24	R	Chapter 14	Exp B4
3/5/24	T	Exam 3 (chapter 13)	Exp B5 : Ka Kb
3/7/24	R	Chapter 16	Exp B5
3/12/24	T	Chapter 16 + Quiz 2	Exp B8 : Calcium Hydroxide
3/14/24	R	Chapter 16	Exp B8
3/19/24	T	Chapter 16	Check out & Study
3/22/24	R	Quarter Wrap-up	Lab Final
3/26/24	T	Final	
Final Time	3/26/24 Tuesday 6:15 pm-8:15 pm		
Final Location	G6		
Final Content:	cumulative, will emphasize on Chapter 14 and 16 ($\geq 40\%$)		

From the American Chemical Society Safety In Academic Laboratories Guidelines, 7th Ed., the following mandatory minimum safety requirements must be followed by all students and be rigorously enforced by all Chemistry faculty:

- 1) Chemistry Department-approved safety goggles purchased from the De Anza College bookstore (NOT safety glasses) must be worn at all times once laboratory work begins, including when obtaining equipment from the stockroom or removing equipment from student drawers, and may not be removed until all laboratory work has ended and all glassware has been returned to student drawers.
- 2) Shoes that completely enclose the foot are to be worn at all times; NO sandals, open-toed, or open-topped shoes, or slippers, even with socks on, are to be worn in the lab
- 3) Shorts, cut-offs, skirts or pants exposing skin above the ankle, and sleeveless tops may not be worn in the lab: ankle-length clothing must be worn at all times
- 4) Hair reaching the top of the shoulders must be tied back securely
- 5) Loose clothing must be constrained
- 6) Wearing "...jewelry such as rings, bracelets, and wristwatches in the laboratory..." should be discouraged to prevent "...chemical seepage in between the jewelry and skin...".
- 7) Eating, drinking, or applying cosmetics in the laboratory is forbidden at ALL times, including during lab lecture
- 8) Use of electronic devices requiring headphones in the laboratory is prohibited at ALL times, including during lab lecture
- 9) Students are advised to inform their instructor about any pre-existing medical conditions, such as pregnancy, epilepsy, or diabetes, that they have that might affect their performance.
- 10) Students are required to know the locations of the eyewash stations, emergency shower, and all exits
- 11) Students may not be in the lab without an instructor being present
- 12) Students not enrolled in the laboratory class may not be in the lab at any time after the first lab period of each quarter.
- 13) Except for soapy or clear rinse water from washing glassware, NO CHEMICALS MAY BE Poured INTO THE SINKS; all remaining chemicals from an experiment must be poured into the waste bottle provided.
- 14) Students are required to follow the De Anza College Code of Conduct at all times while in lab: "horseplay", yelling, offensive language, or any behavior that could startle or frighten another student is not allowed during lab;
- 15) Strongly recommended: Wear Nitrile gloves while performing lab work; wear a chemically resistant lab coat or lab apron; wear shoes made of leather or polymeric leather substitute.

By signing below, I, _____

acknowledge that I fully understand and agree to abide by the laboratory safety rules listed above. Further, I acknowledge that my failure to abide by these rules will result in my being dropped from this chemistry class immediately.

Signature

Date

Student Learning Outcome(s):

- Evaluate the principles of molecular kinetics.
- Apply principles of chemical equilibrium to chemical reactions.
- Apply the second and third laws of thermodynamics to chemical reactions.

Office Hours:

M 07:30 PM 08:30 PM Zoom