General Chemistry III

De Anza College

Term: Winter

Sections: 11 and 12

Instructor: Dr. Brophy

Welcome to the online syllabus for Chem 1C! This course is offered entirely in-person during the Winter 2025 quarter at De Anza College. Attendance at all scheduled labs and lectures is mandatory.

Course Description

This is the third and final quarter in the year-long General Chemistry sequence. In this class, advanced equilibrium concepts pertaining to solubility and buffers will be discussed. This will be followed by an introduction to electrochemistry, the chemistry of transition metals, and nuclear chemistry.

Dr. Brophy's Course Description

Chemistry 1C is the capstone course of the general chemistry curriculum at De Anza College. Throughout Chemistry 1C, we will build-on and expand-upon the concepts introduced in the first two quarter quarters of general chemistry. Through the successful completion of this course, you will build confidence in quantitative chemical calculations and feel empowered to apply a molecular-level understanding of the world to your future studies and aspects of your everyday life. You will hone your information literacy skills by reading a scientific research paper from the primary literature and analyzing its merits and results.

We will cover many topics within the key general chemistry themes of (i) physical properties of matter, (ii) atomic structure and reactivity, (iii) transforming and harnessing energy, and (iv) atomic structure. The lab portion of the class will give you the opportunity to utilize the lab skills that you built in Chem 1A and Chem 1B and apply those skills to complex physical problems. We will also use the lab to introduce real-world examples of concepts that are covered in more detail in lecture.

The homework is designed to help you master molecular concepts and quantitative problem solving, and that mastery will be assessed through three midterm exams and a cumulative final. You will develop practical lab skills as well as information literacy in the lab section of the course.

Class Meeting Times

Section 11	Lab	MW 8:30 am – 11:20 am	SC2208
	Lecture	MW 3:30 pm – 4:45 pm	MLC103

Section 12	Lab	MW 11:30 am – 2:20 pm	SC2208

	Lecture	MW 3:30 pm – 4:45 pm	MLC103

Holidays and Important Dates

January 6

First day of classes

January 19

Last day to drop without a W

January 20

Martin Luther King Jr. Day Holiday
No classes and college offices closed

February 14 – 17

President's Holiday
No classes and college offices closed

February 28

Last day to drop classes with a W

March 24 – 28

Final Exams
Classes do not meet at regular times. Please see the final exam schedule for additional information.

Excused Withdrawal

If circumstances beyond your control prevent you for completing the course, you may qualify for an excused withdrawal. Please see the following website for more information.
https://www.deanza.edu/admissions/withdrawals.html

Course Webpage

The course webpage is through De Anza Canvas. You will be automatically added to the Canvas shell as a student when you enroll in the course. Students on the waitlist do not have access to Canvas. This course webpage is designed to be viewed on a web browser rather than the student app. ***Turn on Canvas notifications*** *to receive class announcements, Inbox messages, and comments/feedback on assignment submissions.*

Community Statement

Every person in this class, regardless of personal history or identity categories, is a welcome and important member of this group. Your experiences are important, and you are encouraged to share them as they become relevant. No person in this group is ever expected or believed to speak for all members of any group(s).

You have the right to determine your own identity, to be called by whatever name you wish, and to be referred to by your pronouns. You have the right to adjust these things at any point. If you find any aspects of facilitation, instruction, subject matter, or program environment that result in barriers to your inclusion, please let me know right away, privately and without fear of reprisal. We are all learning. It is my goal to continue learning and improving to support everyone in this class and, by extension, all my current and future students.

Syllabus Statement

This course syllabus is a contract. Please read it carefully and completely in its entirety before asking me any questions regarding the course schedule, content, requirements, grading, etc. You are expected to adhere to the De Anza College Student Code of Conduct Administrative Policy 5510 at all times. This syllabus is also a living document, and it may be necessary to make minor corrections or changes during the quarter. I will not make major changes to the syllabus except in cases of *force majeure* or following class discussion. ***All corrections and changes to this syllabus will be announced through Canvas.***

This class is divided into two separate instructional threads: a lecture portion devoted to the primary course material and a lab period for conducting lab experiments. At De Anza College, the lab and lecture may not be taken as separate courses under any circumstances

About Your Instructor

Contact Information

Instructor: Dr. Megan Brunjes Brophy
Office: SC1220
E-mail: brophymegan@fhda.edu
Phone Number: 408-864-8338 (*not preferred*)

*Please note that **Canvas Inbox** is the most reliable way to get in touch with me outside of class. I do not reply to messages on evenings and weekends. In general, you can expect a reply from me in 2 business days. If you haven't gotten a response from me in that timeframe, feel free to message me again.*

Office Hours

Office hours are an opportunity for you to come talk to your instructor outside of regular class time. Please bring your homework, notes, reading, or any other assignments. You are welcome to come talk to me about the course, questions that you have about the material or practice problems, and your educational path. Each of my office hours are open to all my students; please come say hi!

Day	Location	Time
Tuesday	SC1220	9:40 am – 11:20 am
Thursday	SC1220	9:40 am – 11:20 am

My Teaching Philosophy

My hope is that every student who takes one of my classes gains an appreciation for the power of chemistry and the beauty of the natural world. It is important to me to design a course that is accessible to students of varying

educational, cultural, and socioeconomic backgrounds while maintaining high intellectual, ethical, and academic standards. I strive to reward consistent, sustained effort throughout the quarter, and my goal is for everyone who takes this class to pass with a C so that they can move on to the next stage of their educational or career pathway.

Enrollment Requirements

Recommended Preparation

I generally expect that students enrolled in Chemistry 1C have taken Chemistry 1A and Chemistry 1B in-person at De Anza College within the previous year. Chemistry 1C covers multiple disparate topics, drawing on different concepts from Chem 1A and Chem 1B. It is vital for students to proactively review prior material and reach out early and often for help. The college provides multiple spaces and services for academic support, including the MSTRC, the PSME Village, and the MESA center.

Prerequisites

Chemistry 1B or 1BH with a grade of C or better.

Advisory

EWRT 1A or EWRT 1AH or ESL 5.
All assignments and assessments are offered and graded exclusively in English.

Late Adds and Add Codes / Drops

I will only give out add codes if space is available during the first week of class. If you are interested in joining the class, you must attend lab and lecture during the first week of the quarter. Students who miss the first lab meeting will not be permitted to enroll in the course under any circumstances. Similarly, if you are enrolled in the course and miss the first lab, you will be dropped from the course during the lab period. ***I do not give out add codes after the first week of class***, and I strongly encourage you to enroll in an open section if you are on the waitlist.

Lab Attendance

Lab attendance on the first day of class is strictly mandatory. Any student who is not present for lab safety and lab check-in will be dropped from the course. Students who miss two labs during the first two weeks of class will be dropped from the course. Missing three or more labs during the quarter may result in a failing grade pending the development of a personal improvement plan.

Supplies and Materials: Lecture

Textbook (Required)

OpenStax Chemistry, 2nd edition. Available free online or on the OpenStax app. You may also purchase a printed and bound copy through Amazon.

Textbook (Optional)

Chemistry: A Molecular Approach, 6th edition by Nivaldo Tro. Available through Pearson eBooks and on reserve in the library.

Online Homework (Required)

SmartWork Direct. For Winter 2025, the online homework platform is available at no additional cost to you.

Calculator (Required)

A scientific calculator with base-10- and natural-log functionality is necessary and sufficient for this class. If you have already purchased a graphing calculator for another class, you may use it on exams and quizzes; however, *we will not use the graphing functionality.* Recommended models:

https://www.amazon.com/Texas-Instruments-MultiView-Scientific-Calculator/dp/B000PDFQ6K
https://www.amazon.com/dp/B005QXO8J0/ref=dp_cerb_3

Molecular Modeling Kit (Recommended)

Many types are available. I like this kit from Duluth Labs, and many dupes are available on Amazon and temu.
https://www.amazon.com/Duluth-Labs-Organic-Chemistry-Molecular/dp/B01N00GAPR?ref_=ast_sto_dp&th=1

We will use the modeling kits starting in week 8.

Workbook (Optional)

Calculations in Chemistry an Introduction, 2nd edition by Dahm and Nelson. This **optional** resource provides additional examples of common problem-solving techniques. I particularly recommend this resource if you haven't taken 1A or 1B in some time or you would like to build confidence in quantitative chemistry. Available at many online retailers.

Supplies and Materials: Lab

Lab Manual

The lab procedures for each lab will be posted as PDFs on Canvas. You must print each lab and bring it with you to class. Personal electronic devices are not permitted while hazardous materials are in use.

Lab Notebook

You are required to have a bound composition-style notebook for this class. Notebooks with metal sprial binding or perforated pages are *not* permitted. Carbon copies are not required for this class. You may reuse or continue a lab notebook from a previous course.

Pen

You must use a non-erasable pen with blue or black in in your lab notebook. Pencil is not permitted.

Computer (and printer) access

You will require internet access and a printer throughout this course. The Library West Computer Lab is located on the lower level of Learning Center West in LCW 102. Printing can be found around campus: https://www.deanza.edu/students/printing.html

GeniusScan or CamScanner

Throughout the quarter, you will turn in handwritten assignments by creating a PDF file and uploading this file to Canvas. Recommended apps include GeniusScan and CamScanner. Do not use any Adobe apps to turn your assignments in—the files end up being too big for me to read! If I can't open the file you send me, you will receive a zero on the assignment.

Nitrile Gloves

You must wear nitrile gloves in lab, and you are encouraged to purchase and bring your own gloves..

Lab Goggles

You must wear lab goggles when we have chemicals or glassware out. The lab goggles must

- Conform to your face with a flexible seal
- Have indirect venting
- Carry an ANSI Z87.1 shatter rating

Campus Resources

Math, Sciences, and Technology Resource Center (MSTRC) Tutoring.

The MSTRC offers tutoring for the Chemistry 1 sequence and is located in room S43 in the S-quad. I strongly recommend that you study in the MSTRC early and often. They have computers and it is a great place to study for your STEM classes. https://www.deanza.edu/studentsuccess/mstrc/

Disability Support Programs Services

The mission of DSPS is to ensure access to the college's curriculum, facilities, and programs. In particular, DSPS can help you get extended time on examinations. Please reach out to them directly if you have questions. https://www.deanza.edu/dsps/

De Anza College Library

The library houses the Library West Computer Lab and group study rooms that may be reserved online. https://www.deanza.edu/library/index.html

Resources for Students

Additional resources may be found at https://www.deanza.edu/services/ . If you need additional resources, I can put you in touch with support services through De Anza Connect. Please give me explicit permission to share any personal information with them.

Student Help Hours

Instructor office hours are the best time to ask questions related to course content in-person. This time is *for you, the student*. Please come!

I expect you to use the resources available, share high-quality resources with your classmates, and ask for help when needed.

Time Commitment

This is a five-unit course: each week consists of three scheduled lecture hours and six scheduled lab hours. In addition to in-class time, you should expect to spend an additional **20 hours a week** studying and working on class assignments to excel in this class.

Course Objectives and Learning Objectives

Course Objectives

1. Investigate the behavior and characteristics of solutions.
2. Examine advanced concepts in equilibrium pertaining to buffers and solubility.
3. Explore transition metal chemistry.
4. Apply fundamental principles of equilibrium to electrochemical systems.
5. Investigate nuclear chemistry.

Learning Objectives

1. Demonstrate a knowledge of intermolecular forces.
2. Apply the principles of equilibrium and thermodynamics to electrochemical systems.
3. Apply the principles of transition metal chemistry to predict outcomes of chemical reactions and physical properties.
4. Evaluate isotopic decay pathways.

Dr. Brophy's Summary of Learning Objectives

In Chemistry 1C, we seek to deepen our understanding of core chemical concepts including molecular structure, chemical reactivity and transformations, and energy changes in chemical processes. We will start with an in-depth study of the properties of solutions and colligative properties—e.g. why do pure water and saltwater have different properties? How can you make ice cream without refrigeration? What are the intermolecular forces involved in solution formation? – as well as solubility equilibrium. We will further study aqueous solutions by studying buffer systems and reactions between weak acids and weak bases. We will turn our attention to electrochemistry– how do batteries work? Why do some substances corrode in oxygen? How do we get energy from reduction-oxidation reactions? We will then study transition metals and coordination complexes, building on your understanding of quantum chemistry to describe new models of bonding. Finally, we finish the course with an exploration of nuclear chemistry and delve into the physical properties of the nucleus as well as real-world applications.

Active Course Outline

You can find a copy of the active course outline of record for this class at:
https://www.deanza.edu/catalog/courses/outline.html?cid=chemd001c

Please save a copy of the active course outline, as well as this syllabus, for your records. You never know when you might need it!

Attendance Policy

Your *punctual* attendance is expected at all class meetings. To be counted "present" and receive credit for that day's activities, you must arrive during the first 5 minutes of class. If you arrive late, you may miss important information. If you will have to miss a class session for any reason, let me know by Canvas message as soon as possible. Notifying your instructor of absences or tardiness shows that you take your responsibility towards yourself and your fellow students seriously. In the case of a documented emergency (e.g. hospitalization, court appearance, car crash), I may excuse you from that day's work. These instances will be handled and decided on a case-by-case basis. Travel does not constitute an emergency or grounds for an excused absence. It is the student's responsibility to get notes from a classmate for missed information.

Late Work Policy

Late work for *SmartWork* assignments will be accepted until March 23rd at 9:00 pm. I do not handle extensions or exceptions over email or through the Canvas inbox. In general, late labs will not be accepted under any circumstances. If you know you will need to miss a dry-lab day (e.g. worksheet), please contact me for requirements for turning it in.

How to Learn Chemistry

Chemistry is broad subject that has a reputation for being hard. This class will utilize many resources in concert to help you gain skills, knowledge, and understanding for you to apply chemical principles to multiple areas of study. The lectures will provide organization and context for the topics that we cover, and you should use the assigned reading to fill in the details.

1. Know where to find relevant information for the course, in particular the assigned reading for both the labs and the lectures.
2. Complete the assigned reading before coming to class. Review 1A topics that are unfamiliar. Write down any vocabulary words that you do not understand as well as their definitions *from the textbook*.
3. Practice and develop your critical reading skills.
4. Take *handwritten* notes during class and review your notes regularly. Cognitive science tells us that we learn new information better when we write rather than type.
5. Review your notes early and often. Use the assigned reading to fill in details and redraw important figures.
6. Write down any questions you have. Bring these questions with you to office hours or the drop-in tutoring center.
7. Most of the "rules" that you learn in chemistry are guidelines. There are exceptions. You will recognize these exceptions more as your chemical intuition builds.
8. Do a little bit every day. After every lecture, review the reading assignment and complete in-chapter and end-of-chapter exercises. Spend at least an hour on chemistry every day.
9. Seek conceptual understanding. Memorization will follow.
10. Join a study group. Work on problem sets together. The best way to learn the material is to teach it to somebody else.
11. Utilize the free tutoring services on campus and online through the MSTRC.
12. Turn in and finish assignments as soon as you are able. Don't assume that you'll have time to do it later, or immediately before the deadline. Life is unpredictable.
13. Take care of yourself! Stay well-rested and drink water. Your physical health and safety are your priority. If you need assistance with any basic needs, please reach out to me to referrals to campus resources.

Laboratory Safety

All chemistry laboratories inherently come with associated risks and hazards. It is inevitable that some accidents will occur during your chemistry course work. When a minor accident occurs, ***inform your instructor immediately*** and ***do not attempt to clean-up any broken glassware or spilled chemicals by yourself.*** In order to ensure that the lab is as safe as possible, we must (1) ***Recognize hazards***, (2) ***Assess the risks of hazards***, (3) ***Minimize the risks of hazards***, and (4) ***Prepare for emergencies***.

You have the right to advocate for yourself. If you feel a particular procedure or chemical is unsafe, or a specific accommodation will enhance your lab experience, I welcome your feedback. I may not have an answer or solution for you right away, but I will work on your behalf to make sure that you can complete the labs safely.

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:

Enrollment Limits: Due to safety concerns and space limitations, enrollment for Chem 1ABC, Chem 10, Chem 25, and Chem 30AB is limited to no more than 30 students. Organic Chemistry (12ABC) is limited to no more than 26 students.

In case of an emergency, dial 911 from a classroom phone. If you must use a cellphone, the FHDA police emergency number is 408-924-8000.

Please see https://www.deanza.edu/collegeops/emergencies/evacuation.html for evacuation procedures and other emergency preparedness information.

The following rules must be followed at all times in the lab rooms, regardless of the activity.

1. 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
2. Shorts, cut-offs, skirts or pants exposing skin above the ankle, and sleeveless tops or tops that expose the abdomen may not be worn in the lab: ankle-length clothing must be worn at all times.
3. Eating, drinking, or applying cosmetics in the laboratory is forbidden at ALL times, including during lab lecture. Food and drink containers must be stored outside the lab.
4. Use of electronic devices requiring headphones or earbuds in the laboratory is prohibited at ALL times, including during lab lecture.

The following rules must be followed anytime students have glassware or chemicals out and in use. Note that if some students finish their experiments, they must keep their PPE on while others have chemicals and glassware out.

5. Chemistry Department-approved safety goggles (NOT safety glasses) must be worn at all times once laboratory work begins. Safety goggles must include a flex seal and indirect venting, and carry ANSI Z87.1+ and CSA Z94.3 certifications. Appropriate goggles may be purchased from the De Anza College bookstore.
6. Goggles must be worn at all times after lab lecture, 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 all student drawers.

7. Nitrile gloves should be worn when handling chemicals and glassware and removed prior to handing any personal electronic devices.
8. Hair reaching the top of the shoulders must be tied back securely
9. Loose clothing must be constrained
10. Chemically-resistant and flame-retardant lab coats are strongly recommended.
11. Shoes made out of leather or polymeric leather substitute are strongly recommended.
12. Wearing "...jewelry such as rings, bracelets, and wristwatches in the laboratory..." is discouraged to prevent "...chemical seepage in between the jewelry and skin...".
13. Students with a medical condition or disability (e.g. learning, sensory, mental health, or physical condition) that may hinder their ability to participate or succeed in the class safety should contact DSPS to coordinate accommodations. You may also communicate necessary accommodations directly to your instructor, and you are under no obligation to reveal private details.
14. If you are pregnant or experiencing a related condition, you are advised to contact the campus Title IX coordinator (Laureen Balducci, balduccilaureen@fhda.edu) to arrange necessary accommodations.
15. Students are required to know the locations of the eyewash stations, emergency showers, and all exits.
16. Backpacks and other trip hazards must be stored under a desk and walkways must remain clear.
17. Students may not be in the lab without an instructor being present.
18. Students on the waitlist may not participate in lab activities until and unless enrolled in the course.
19. 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 by your instructor.
20. You may only perform experiments as instructed.
21. At the end of each experiment, all glassware should be cleaned with water and detergent prior to storage.
22. Any chemical spills or broken glassware must be cleaned up immediately. Broken glassware must go in the sharps waste and not in the regular trash.
23. 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.

Reckless behavior will not be tolerated. If your actions endanger the health and safety of yourself or another person, you will be asked to leave and you will receive a zero for the lab and related assignments. In extreme cases, you may lose your lab privileges for the remainder of the quarter and/or fail the course.

Academic Integrity Policy

The process of learning requires physical changes to occur in your brain. *Cognitive research demonstrates that consistent practice and learning to recognize mistakes are key aspects of the learning process*. As such, all students should be aware of the De Anza College policy on academic integrity outlined at https://www.deanza.edu/policies/academic_integrity.html. The following text is reproduced from the De Anza College manual:

> *the college is committed to providing academic standards that are fair and equitable to all students in an atmosphere that fosters integrity on the part of student, staff and faculty alike. The student’s responsibility is to perform to the best of his or her potential in all academic endeavors. This responsibility also includes abiding by the rules and regulations set forth by individual faculty members related to preparation and completion of assignments and examinations.*

I expect that all work submitted for this class will represent your own understanding of the material and must be written in your own words. Cheating, copying, plagiarizing, etc. will not be tolerated. Due to the "online" nature of the class, students must take extra care to abide by the policies and expectations set forth for each assignment. While it is tempting to use the full weight of the internet, some sources may provide misleading or corrupt information. Students should focus on the required reading and recommended resources for the class, and any other sources must be vetted by the instructor. Tutoring resources are allowed for homework assignments; however, using a paid, static resource is forbidden. This can be particularly challenging as some websites that profess to provide tutoring services are actually destructive to the learning process. A good rule-of-thumb is that any tutoring service will help you solve a problem and arise at an answer *on your own*—this means that your brain is making new physical connections between neurons, and you are learning! If an online source professes to offer tutoring, but instead provides you with answers, this is cheating. The websites Chegg, CourseHero, Reddit, as well as any similar site are explicitly forbidden for all class assignments. Posting class assignments on these websites is considered intent to cheat. I am happy to discuss appropriate resources with you, and I encourage you to *ask for permission.*

You may collaborate with your classmates on lecture homework assignments; however, the final work that you submit must reflect your own understanding of the material. Do not allow any other student to copy your work under any circumstance. If a student asks if they can copy your work or "just see it as an example", ask them to reach out to the instructor for help. If two students turn in the same work, both students will have participated in academic dishonesty.

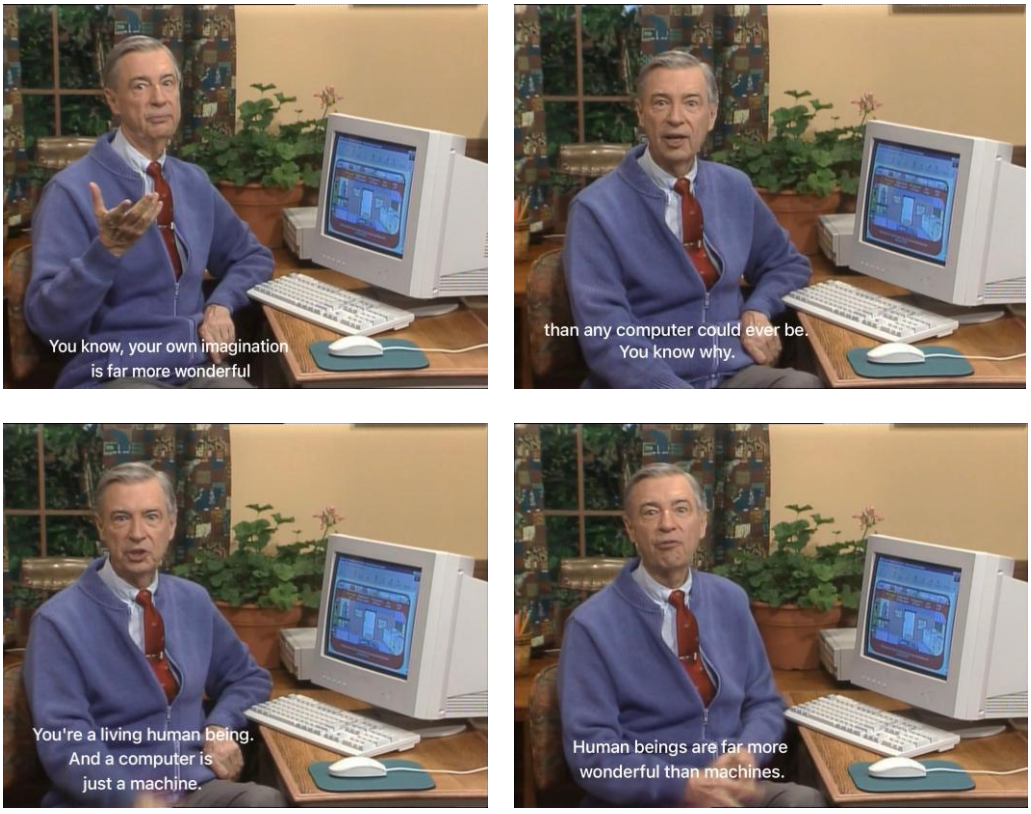
Class assessments are used to measure an individual student's mastery of the material. They are all closed resource, and you will be provided with any physical constants or additional information as necessary. A common mistake that past students have made is to Google a question and copy an answer from the internet—this behavior is forbidden, and the consequences are described below. If I suspect cheating on a quiz, you will be required to meet with me face-to-face.

Any incident of cheating or plagiarism, no matter how minor, will be reported to the Dean of Student Development and the Dean of the Physical Sciences, Mathematics, and Engineering division. Administrative consequences are summarized in the college manual. Additional consequences will be applied to your course grade. Please see the Grading Specifications Table for more information. If academic dishonesty is discovered within two-years of your completion of the course, your official grade will be changed.

I recognize that these consequences may sound scary. Unfortunately, I have had students who did not pass this class as a direct result of academic dishonesty. I *am* committed to supporting you and your learning process, and I expect you to display high ethical standards. I encourage you to bring questions to class and utilize the class discussions for additional feedback. If you are not sure if a resource is allowed, or if something feels "off" to you, alert your instructor right away. *I do reserve the right to make major changes to the class structure—including requiring an oral exam / exit interview—if there are widespread violations of the academic integrity policy*.

AI Use Policy

The use of generative AI platforms (such as but not limited to ChatGPT and OpenAI) for any student-submitted work is strictly forbidden. You may use AI-based algorithms (e.g. GoogleTranslate, Grammerly) for minor edits, formatting suggestions, and clarification.



Grading Policies and Assignment Types

To succeed in this course, you need to exhibit ***consistent and sustained effort*** throughout the quarter. This will be demonstrated through in-class participation, laboratory preparation and data analysis, and examinations. Assignment types are assigned a weight; not all points are created equally!

Weighted Grading Scheme

Lecture	**60% of total grade**
SmartWork Homework	5%
Quizzes (top 5 scores)	15%
Exams (top 2 scores)	40%
Lab	**40% of total grade**
Lab tickets	5%
Lab assignments	15%
Lab assessments	15%
Literature activity	5%

Grade Scale

Final %	Grade[1,2]
>99.00	A+
>90.00	A
88.00 – 89.90	A–
85.00 – 88.90	B+
80.00 – 84.90	B
78.00 – 79.90	B–
75.00 – 77.90	C+
68.00 – 74.90	C
63.00 – 67.90	D+
55.00 – 62.90	D
<55%	F

[1] If your average in either the lab *or* lecture portion of the course is less than 55%, you will receive an F as a final grade.

[2] A+ grades will be given to students who demonstrate excellence in the following three areas: lecture, lab *and* class participation.

Note that grades for individual assignments will be entered in Canvas; however, the gradebook and assignment types may not be finalized until the end of the quarter. I encourage you to make your own spreadsheet to keep track of your letter grade throughout the quarter. The student-facing gradebook in Canvas is limited and may not be an accurate representation of your grade throughout the quarter. Please come talk to Dr. B during office hours if you have questions about your grade.

Assignment Types (Lecture)

Your attendance and active participation are expected at every lecture period. If you know that you will not be able to attend lecture for any reason, let me know by email right away (even if only 5 minutes before class or 5 minutes after the start of class). You are responsible for communicating with a classmate to get any notes or missed information. Late arrivals and early departures are distracting for the whole class (and me!), so arrive on time and stay for the whole class period. I strongly encourage taking your own notes in lecture. We will sometimes use computers or other electronic devices; however, do not use your computers for non-course related activities during lecture. Put your phone on silent or Do Not Disturb while you are in class. If you must take a phone call in case of emergency, quietly leave the room before answering the phone.

Online Homework

SmartWork in an online homework platform offered through Norton. Please note that you must access SmartWork through Canvas. In general, there will be one homework assignment for each lecture.

Quizzes and Exams

Quizzes will be administered during lecture. There will be a total of 6 quizzes. Quizzes are *closed note* and no additional resources will be allowed. There will be two midterm exams and one comprehensive final offered this quarter; however, only your top 3 scores will be used to calculate your final grade. Please see the Weekly Schedule for specific dates and content information.

Early and late exams and quizzes will not be administered, and missing an exam or quiz will result in a zero. You should arrive to class on time for the exams and quizzes. I do ***not*** guarantee that you will be able to take

the exam if you arrive late. I am unable to accommodate make-up exams or quizzes under any circumstances. If you require any accommodations for exams, you must be approved by DSPS. For extended-time or reduced-distraction exams, please schedule your exam in the DSPS office.

Midterm exams will consist of both multiple-choice questions and short answer questions. You must show your work to receive credit for any calcuation. Detailing any mathematical steps in a clear fashion will communicate your understanding of the material. You will be asked to demonstrate your conceptual understanding of the material and apply those concepts in an algebraic context and solve quantitative problems. The quizzes and the final exam will be entirely multiple choice questions.

You should bring a scientific or graphing calculator with you to each exam. ***Phones, smart watches, and other computers are not permitted in any circumstances***. If I see you on your phone or other electronic device (besides a regular calculator), you will receive a zero on the exam and I will file an academic dishonesty report.

The final exam will be administered during the designated final exam time on the **Monday of finals week from 4:00 – 6:00 pm in MLC103**. This date and time are determined by De Anza College and cannot be moved under any circumstances. If you cannot take the exam at this time, you will receive a zero. You may verify the designated final exam on the De Anza College website, and please notify me immediately on any errors on this syllabus.

Assignment Types (Lab)

Chemistry is an experimental science, and the laboratory is a major component of the course. De Anza College does not offer make-up labs, and ***you must attend the laboratory section that you are registered fo****r* to complete the required labs. Everyone gets one excused absence with no grade penalty. A second absence, regardless of the circumstances of your first absence, will result in a zero for the lab and all associated assignments. After a third lab absence, you will be required to meet with your instructor to develop a personal improvement plan and you may fail the class.

Your timely attendance is expected at every lab. The beginning of each lab period is reserved for lab lecture. The lab lecture is a required component of the laboratory section and will include essential safety information. ***If you miss lab lecture, you will not be permitted to complete that lab and you will receive a zero for all related assignments***.

You must clean up your work area before leaving each lab. Failure to do so will result in a loss of points for that lab. Before you leave lab, ***check-out with me***. You will not receive credit for the lab unless I have reviewed your data and analysis.

Lab assignments may consist of pre-labs, completion of laboratory experiments and mindful data collection, and analysis of data.

Lab Safety Quiz

The lab safety quiz must be completed with 100% accuracy before you can complete any lab experiments. The quiz will be available on Canvas.

Lab Tickets

Lab tickets, or pre-lab assignments, will vary by lab; however, they will generally include assigned reading, safety preparation, and an introduction to the lab experiment. **All lab procedures for this quarter are posted on Canvas. Do not refer to the lab manuals on the department webpage.** I expect you to come to lab prepared to complete each experiment with minimal delays. Pre-lab assignments will be checked by your instructor at the beginning of your lab.

Pre-labs will generally be graded out of 3 points. As a rough rubric, scoring 3/3 points on a pre-lab means that you have completed the lab to a high standard (e.g. detailed and unambiguous schematic of the procedure, answer all questions in full sentences, reagents/supplies/and amounts are listed); 2/3 indicates the pre-lab is good but there is room for improvement; 1/3 indicates that the pre-lab is incomplete or lacks detail.

Note that lab tickets are front-loaded; that is, there are more at the beginning of the quarter than the end of the quarter. Make sure that you start strong!

Lab Participation and Completion

You will receive credit for coming to lab and completing the experiment with your lab group, and Dr. B will verify your data before you leave lab for the day. ***Data collected during the lab period must be recorded directly in your laboratory notebook in pen***. You will not receive credit for any data written on a worksheet or separate piece of paper. Before you leave lab for the day, have me check off on your data in your lab notebook for the available points.

The entire class is responsible for the lab housekeeping. If the lab or balance room are left messy, or the equipment is not correctly stored, the entire class will lose points.

Arrive on time	1 point
Complete the lab safely	1 point
Record data in your lab notebook	1 point
Clean up your station and equipment before the end of class	2 points
total	**5 points**

Analysis Worksheets

Data analysis worksheets will be posted on the course webpage. The precise nature of the assignment and the number of points available will vary. Analysis worksheets should generally be printed or completed on a tablet. The analysis worksheet should be the final version of what you turn in—I recommended doing at least one set of calculations in your lab notebook for later reference.

Lab Assessments

There will be one lab midterm and one quiz in this class. The lab midterm is scheduled for **February 19th during your lab session** and it will cover material from the following labs:

Lab 1: Freezing point depression
Lab 2: pK_a of a pH indicator
Lab 3: Buffers and acid-base titrations
Lab 4: K_{sp} and common ion effect

The lab quiz, currently scheduled for **the check out day during your lab session**, will cover material from the qualitative analysis labs on anions and cations.

The lab assessments are "open lab notebook"– you may use any notes that you have handwritten in your lab notebook. Lab manuals, worksheets, and additional printouts are not permitted. I will do a lab notebook check before we begin assessments.

Literature Activity

As part of your lab grade this quarter, you will strengthen your information literacy and critical skills by reading a scientific research article from the primary literature. Additional details will be announced on Canvas.

Lecture Schedule and Assigned Readings

Chemistry 1C will cover material presented in chapters 11, 14, 15, 17, 19, and 21 of OpenStax Chemistry. We will also review Chemistry 1A and Chemistry 1B topics throughout the quarter.

I will make every effort to keep to the lecture schedule below; however, quiz and exam dates may change due to unforeseen circumstances. Any changes to will be announced in class or through Canvas.

Week	Date	Day	Lecture Topic ***Readings***
1	1/6	M	**Lecture 1** **Welcome to Chem 1C!** **Acid-base chemistry Review** *Required Reading* https://openstax.org/books/chemistry-2e/pages/14-1-bronsted-lowry-acids-and-bases https://openstax.org/books/chemistry-2e/pages/14-2-ph-and-poh https://openstax.org/books/chemistry-2e/pages/14-3-relative-strengths-of-acids-and-bases https://openstax.org/books/chemistry-2e/pages/14-4-hydrolysis-of-salts https://openstax.org/books/chemistry-2e/pages/14-5-polyprotic-acids
	1/8	W	**Lecture 2** **Buffers and the Henderson-Hasselbalch Equation** *Required Reading* https://openstax.org/books/chemistry-2e/pages/14-6-buffers
2	1/13	M	**Lecture 3** **Acid-base titrations** *Required Reading* https://openstax.org/books/chemistry-2e/pages/14-7-acid-base-titrations
	1/15	W	**Quiz 1: Acid-base Chemistry** **3:30 pm – 3:50 pm in MLC103** **Lecture 4** **Properties of Solutions** *Required Reading* https://openstax.org/books/chemistry-2e/pages/11-introduction https://openstax.org/books/chemistry-2e/pages/11-1-the-dissolution-process https://openstax.org/books/chemistry-2e/pages/11-2-electrolytes
3	1/20	M	**Martin Luther King Jr. Day** *No classes and college offices closed.*

	1/22	W	**Lecture 5** **Solubility** *Required Reading* https://openstax.org/books/chemistry-2e/pages/11-3-solubility https://openstax.org/books/chemistry-2e/pages/11-4-colligative-properties
4	1/27	M	**Quiz 2: Solutions and Solubility** **3:30 pm – 3:50 pm in MLC103** **Lecture 6** **Colligative properties** *Required Reading* https://openstax.org/books/chemistry-2e/pages/11-4-colligative-properties
	1/29	W	**Lecture 7** **Solubility Equilibria and the Common Ion Effect** *Required Reading* https://openstax.org/books/chemistry-2e/pages/15-1-precipitation-and-dissolution
5	2/3	M	**Quiz 3: Solubility Equillibria** **3:30 pm – 3:50 pm in MLC103** **Midterm 1 Review**
	2/5	W	**Midterm 1** **3:30 pm – 4:45 pm in MLC103** *This exam will cover Solutions, Acid-Base Equilibria, and Solubility Equilibria* *OpenStax* Chapter 11, Chapter 14, Chapter 15 section 1
6	2/10	M	**Lecture 9** **Electrochemistry** *Required Reading* https://openstax.org/books/chemistry-2e/pages/4-2-classifying-chemical-reactions https://openstax.org/books/chemistry-2e/pages/17-1-review-of-redox-chemistry https://openstax.org/books/chemistry-2e/pages/17-2-galvanic-cells https://openstax.org/books/chemistry-2e/pages/17-3-electrode-and-cell-potentials
	2/12	W	**Lecture 10** **Electrochemistry** *Required Reading* https://openstax.org/books/chemistry-2e/pages/17-4-potential-free-energy-and-equilibrium https://openstax.org/books/chemistry-2e/pages/17-5-batteries-and-fuel-cells https://openstax.org/books/chemistry-2e/pages/17-6-corrosion https://openstax.org/books/chemistry-2e/pages/17-7-electrolysis
7	2/17	M	**No Classes – President's Day**
	2/19	W	**Quiz 4: Electrochemistry** **3:30 pm – 3:50 pm in MLC103** **Lecture 11** **Coupled equilibria** *Required Reading* https://openstax.org/books/chemistry-2e/pages/15-2-lewis-acids-and-bases https://openstax.org/books/chemistry-2e/pages/15-3-coupled-equilibria
8	2/24	M	**Lecture 12** **Transition metals: coordination compounds** *Required Reading* https://openstax.org/books/chemistry-2e/pages/19-2-coordination-chemistry-of-transition-metals

	2/26	W	**Lecture 13** **Transition metals: spectroscopic and magnetic properties** *Required Reading* https://openstax.org/books/chemistry-2e/pages/19-3-spectroscopic-and-magnetic-properties-of-coordination-compounds
9	3/3	M	**Lecture 14** **Transition metals: Reactivity** *Required Reading* https://openstax.org/books/chemistry-2e/pages/19-1-occurrence-preparation-and-properties-of-transition-metals-and-their-compounds
	3/5	W	**Quiz 5: Transition Metals** **3:30 pm – 3:50 pm in MLC103** **Midterm 2 Review**
10	3/10	M	**Midterm 2** **3:30 pm – 4:45 pm in MLC103** *This exam will cover Electrochemistry and Transition Metal Chemistry* *OpenStax* Chapter 4.2, Chapter 17, Chapter 19, and Chapter 15.2–15.3
	3/12	W	**Lecture 14** **Nuclear chemistry** *Required Reading* https://openstax.org/books/chemistry-2e/pages/21-1-nuclear-structure-and-stability https://openstax.org/books/chemistry-2e/pages/21-2-nuclear-equations https://openstax.org/books/chemistry-2e/pages/21-3-radioactive-decay
11	3/17	M	**Lecture 15** **Nuclear chemistry and radioactive decay** *Required Reading* https://openstax.org/books/chemistry-2e/pages/21-4-transmutation-and-nuclear-energy https://openstax.org/books/chemistry-2e/pages/21-5-uses-of-radioisotopes https://openstax.org/books/chemistry-2e/pages/21-6-biological-effects-of-radiation
	3/19	W	**Quiz 6: Nuclear Chemistry** **3:30 pm – 3:50 pm in MLC103** *(OpenStax Chapter 21)* **Final Exam Review**
12	3/24	M	**Final Exam** **4 pm – 6 pm in MLC103** *The final exam is cumulative and will consist of 25 multiple-choice questions, each worth 4 points.*

Final grades will be available through MyPortal by the second Sunday after finals week. For more information, please see https://www.deanza.edu/apply-and-register/register/grades.html. If there is a problem with your final grade, please come see me at the beginning of the following quarter.

Lab Schedule

This is the lab schedule for Chemistry 1C. Labs meet twice weekly on Mondays and Wednesdays. The expected laboratory schedule for Winter 2025 is given below. Pre-lab and post-lab assignments will be available on Canvas and are typically due in class.

Week	Monday	Wednesday

1	**Check-In** Complete lab safety assignment at home	***pKa of Bromocresol Green Day 1*** Collect data for Parts I and II
2	***pKa of Bromocresol Green Day 1*** Complete analysis (group assignment)	***Buffers Day 1*** Part 2: Titration of a weak base with a strong acid
3	***No Class for Martin Luther King Jr. Day***	***Buffers Day 2*** Part 2 Analysis Calculations for Part 1
4	***Buffers Day 3*** Part 1: Prepare buffer	***Freezing Point Depression Day 1*** Collect data
5	***Freezing Point Depression Day 2*** Analysis	***K_{sp} and Common Ion Effect Day 1***
6	***K_{sp} and Common Ion Effect Day 2***	***K_{sp} and Common Ion Effect Day 3***
7	***No Class for President's Day***	***Lab Midterm*** ***Qualitative Analysis of Anions Day 1***
8	***Qualitative Analysis of Anions Day 2***	***Electrochemistry Day 2***
9	***Qualitative Analysis of Cations Day 1*** Prelab and planning	***Qualitative Analysis of Cations Day 2***
10	***Qualitative Analysis of Cations Day 3***	***Qualitative Analysis of Cations Day 4***
11	***Qualitative Analysis of Cations Day 5***	***Check Out*** ***Qualitative Analysis Quiz***

Student Learning Outcome(s):

• Apply the principles of equilibrium and thermodynamics to electrochemical systems.
• Apply the principles of transition metail chemistry to predict outcomes of chemical reactions and physical properties.
• Evaluate isotopic decay pathways.
• Demonstrate a knowledge of intermolecular forces.

Office Hours:

T,TH	09:40 AM	11:20 AM	In-Person	SC1220