

Section 65 CRN 21580
Lecture T/Th 6:00 pm – 7:15 pm in SC1102
Lab M/W 7:30 pm - 10:20 pm in SC2202

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The course webpage is through De Anza Canvas: <https://deanza.instructure.com/courses/36586>.
When you enroll in the course, you will be automatically added to the Canvas shell as a student.

Office Hours: T/Th 10:30 pm-11:30 pm

Instructor: Dr. Valeria Martinovic **E-mai:** martinovicvaleria@fhda.edu

This course provides an introduction to the structure and reactivity of matter at the molecular level, as well as an application of critical reasoning to modern chemical theory and structured numerical problem-solving. Students will learn the development of molecular structure from rudimentary quantum mechanics, including an introduction to ionic and covalent bonding; chemical problem solving involving both formula and reaction stoichiometry employing the unit analysis method, and be introduced to thermochemistry and a discussion of the first law of thermodynamics.

Chemistry 1A is the first quarter of the year-long college-level chemistry course. This sequence course is designed for students pursuing a bachelor's degree in chemistry and other STEM-related fields. This class moves quickly through a brief review of foundational topics (significant figures, mathematical methods, chemical nomenclature) and into more advanced stoichiometry calculations and types of chemical reactions. We will examine the role of energy transfer in quantum models of the atom and then build upon the Schrodinger model of the atom to molecular structure and covalent bonding models. This is a fast-paced course that contains both lecture and lab components. In the lecture portion of the course, your growth and learning will be measured through daily problem sets and in-class practice problems. Your mastery of the material will be assessed through three midterm exams and one cumulative final exam. In the lab portion of the class, you will apply concepts learned in the lecture and grow your practical skills through hands-on experimentation. Your understanding of the labs will be assessed through a series of quizzes.

I assume students enrolled in Chemistry 1A took Chemistry 25 (or equivalent) in person at De Anza College within the previous year. Chemistry 1A requires strong math and study skills. Because of this, it is essential 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.

Late Adds and Add Codes / Drops

I will only give out add codes if space is available by the second lab session. If you want to join the class, *you must attend lab and lecture during the first week*. Students who miss the first lab session will not be permitted to enroll in the course under any circumstances. Similarly, if you are enrolled in the course and miss the safety 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.

Students who miss two labs during the first two weeks of class will be dropped from the course.

Course Objectives:

- Examine contributions by investigators of diverse cultures and times to the body of chemical knowledge, emphasizing physical and chemical conceptual frameworks.
- Investigate the critical aspects of measurement.
- Explore the historical development of understanding the structure of the atom.
- Assess the development of the Periodic Table of Elements in light of modern atomic theory.
- Differentiate the causes and types of molecular bonding.
- Appraise the effect of quantum mechanics on the formulation of molecular structure.
- Employ systematic nomenclature to the identification of molecules.
- Utilize the principles of stoichiometry to analyze compounds, chemical mixtures, and reactions.
- Examine the prominent characteristics of solutions.
- Classify the major types of chemical reactions.
- Apply the essential principles of thermodynamics to chemical systems.

Learning Objectives:

- Identify and explain trends in the periodic table.
- Construct balanced reaction equations and illustrate principles of stoichiometry.
- Apply the first law of thermodynamics to chemical reactions.

Important Dates:

First Day, First day of class! In-person attendance is expected.

**Last Day
Holiday**

Last day to *withdraw* from the course. For a complete list of important dates, please see <https://www.deanza.edu/calendar/>

If circumstances beyond your control prevent you from 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>

Supplies and Materials:

Required Material

- **Textbook:** Silberberg, Chemistry: The Molecular Nature of Matter and Change, any edition
- General Chemistry Laboratory (De Anza 2015 edition) – see lab PDFs at <https://www.deanza.edu/chemistry/Chem1A.html>
You must print the lab manual experiments and bring them to the lab. *Electronic devices may **not** be out and in use during lab experiments.*
- **Homework** is posted in ALEKS. Go to the ALEKS module in Canvas and click on the ALEKS icon at the bottom (do not click on the Customize button!). You will get a free two-week access code.
- Safety Goggles (must be approved by instructor)
- Scientific calculator

Supplies and Materials: Lab

- **Personal Protective Equipment** PPE is required for each wet lab day and is essential to keep you and your colleagues safe and healthy. You may not participate in the lab without PPE.
 - Approved laboratory safety goggles (not safety glasses), available from the De Anza College Bookstore. Safety goggles must carry an ANSI Z87.1 shatter rating. If you purchase safety goggles from another retailer, you must present the packaging with verification of ANSI rating to your instructor.
 - Disposable latex or nitrile gloves.
 - Long pants/skirts and closed-toe shoes must be worn in the lab.
 - A lab coat or lab apron is optional and recommended.
- **Pen:** Bring a non-erasable blue or black ink pen to the lab.

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/>.
- **Student Help Hours** Instructor office hours are the best time to ask questions about course content in person. This time is *for you, the student*. Please come!

Time Commitment:

This is a five-unit course. Each week, you will spend three hours of lecture in class and six hours of laboratory. To excel in this class, you should expect an additional 20 hours a week studying and working on class assignments.

Attendance Policy:

Your punctual attendance is expected at all lecture and laboratory sections of the course. *Plan to arrive 5-10 minutes early.* If you miss a lecture or lab, let me know immediately. If you miss either lab or lecture, please arrange a time to meet with a fellow student so that you can get notes and find out what you missed. (*Note: Punctuality is essential. I understand that things happen and traffic can be*

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unpredictable; however, your habit should be to arrive at class on time. I do notice if you are routinely late.) You do not need to tell me why you are missing class.

The De Anza College Chemistry Department does not offer make-up labs under any circumstances. ***If you miss 3 lab periods, you will fail the course.*** This is non-negotiable. Consider if this is the best quarter for you to commit to this class.

Grading Policy:

To succeed in this course, you need to exhibit ***consistent and sustained effort that will be*** demonstrated by your participation, laboratory preparation, data analysis, and assessments.

Grade Distribution:	
Homework Assignments	10%
Lab Reports and Lab exam	20%
Midterms	60%
Final Exam	10%

All grades will be assigned according to the following percentage scale set up in Canvas:

A+ ≥ 98% A ≥ 92% A- ≥ 89% B+ ≥ 85% B ≥ 82% B- ≥ 79% C+ ≥ 75% C ≥ 68% D ≥ 64% D- ≥ 58%
F < 58

Exam Policies (read carefully). If you violate our honor code, you will be reported to the Office of Student Conduct and receive an F for the course.

- The exams will be conducted on Canvas during our regular class time.
- You must bring your laptop to class to take the exam on Canvas.
- You can NOT use online resources, and you are NOT permitted to talk to

EXAM DATES:

Fall 2024

LECTURE EXAM 1: 10/15/2024

LECTURE EXAM 2: 11/12/2024

LECTURE EXAM 3: 12/03/2024

LAB EXAM (CRN: 21580) on 12/04/2024/ (CRN: 21581) on 12/05/2024

COMPREHENSIVE SEMESTER FINAL EXAM: 12/10/2024

Academic Integrity:

The process of learning requires physical changes to occur in your brain. Cognitive research demonstrates that consistent practice and learning to recognize mistakes are critical 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 students, 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 regarding the preparation and completion of assignments and examinations.

You may collaborate with your classmates on lecture homework assignments; however, the final work you submit must reflect your 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 contact the instructor for help. If two students turn in the same work, both students will have participated in academic dishonesty.

Class assessments measure an individual student's mastery of the material. They are all closed resources; you will be provided with any physical constants or additional information as necessary. A common mistake 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 must meet 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. **The first incident of academic dishonesty will result in zero points on the assignment, a potential grade penalty of up to 10% to be deducted from your final grade, and loss of any extra credit points for the quarter.** Any subsequent instances of academic dishonesty, no matter how minor, will result in class failure. In short, academic dishonesty will harm your grade and may result in disciplinary probation or expulsion. If academic dishonesty is discovered within two years of your course completion, your official grade will be changed.

Lecture:

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

Lectures:

Chapter 1: Definitions, Units, and Problem Solving

Chapter 2: The Concepts of Matter

Chapter 3: Stoichiometry of Formulas and Equations

Chapter 4: Three Major Classes of Chemical Reactions

Chapter 6: Thermochemistry Energy Flow and Chemical Change

Chapter 7: Quantum Theory and Atomic Structure

Chapter 8: Electron Configuration and Chemical Periodicity

Chapter 9: Models of Chemical Bonding

Chapter 10: The Shapes of Molecules

Laboratory:

The total lab grade constitutes 20% of the final grade. Make sure to attend labs; no makeup labs will be allowed! We will conduct 11 experiments and turn in 11 **Lab Reports**. The format for each lab report will be discussed in the lab. LABORATORY REPORTS generally include lab notebook preparation (pre-lab), recording of data in the notebook, and laboratory report sheets. The signed pre-lab must be attached to each lab report. Each lab report will be worth 10 points and will be due at the start of the lab lecture on the day it is due.

Pre-Labs: Before beginning a new experiment, you must complete a pre-lab. I will sign your prelab at the start of the lab lecture on the day it is due. Late pre-labs will not be accepted! Pre-labs should be prepared directly in your lab notebook and must be handwritten. Unless otherwise directed, you need not answer any pre-lab or post-lab questions in the laboratory manual. Your pre-lab should include, at a minimum, the following three items:

- a) **Chemical hazards** • List any critical safety information about the chemicals you are using that is given in your experimental procedure. If the procedure does not provide specific chemical safety information for a particular compound, you can find more information online by searching for that compound's Safety Data Sheet (SDS).
- b) **Chemical disposal** • List each substance or mixture generated during the experiment and the appropriate waste container – acidic aqueous, basic aqueous, or organic – should be disposed of. If you are unsure how a substance or mixture should be appropriately disposed of, leave space so that you can fill in that information during the lab lecture.
- c) **Procedure** • You must rewrite the whole procedure in your own words with enough detail to perform the lab successfully without referring to the lab textbook. Do not simply copy the procedure verbatim. You do not have to include any portions of the experiment related only to theory, only the procedure itself.

Laboratory Safety:

All chemistry laboratories inherently come with associated risks and hazards. Some accidents will inevitably occur during your chemistry coursework. When an accident occurs, **inform your instructor immediately** and **do not attempt to clean up any broken glassware or spilled chemicals by yourself**. 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*,

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 enclose entirely 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, including during lab lectures.** *Food and drink containers are not allowed in the lab at any time. If I see them, I will put them outside.*
- 8) Use of electronic devices requiring headphones in the laboratory is prohibited at ALL times, including during lab lectures.
- 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 showers, and all exits.
- 11) Students may only be in the lab with an instructor 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 must 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.

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 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 fail the course.

Tentative Laboratory Schedule
CHEM 1A LAB SCHEDULE – FALL 2024

WEEK OF	WEEK	MONDAY CRN:21580	TUESDAY CRN: 21581	WEDNESDAY CRN: 21580	THURSDAY CRN: 21581
9/22/2024	1	CHECK-IN	CHECK-IN	MEASUREMENT	MEASUREMENT
9/29/2024	2	NOMEMCLATURE	NOMEMCLATURE	HYDRATE (1)	HYDRATE (1)
10/6/2024	3	HYDRATE (2)	HYDRATE (2)	TYPES OF REACTIONS (1)	TYPES OF REACTIONS (1)
10/13/2024	4	TYPES OF REACTIONS (2)	TYPES OF REACTIONS (2)	PRECIPITATION (1)	PRECIPITATION (1)
10/20/2024	5	PRECIPITATION (2)	PRECIPITATION (2)	PRECIPITATION (3)	PRECIPITATION (3)
10/27/2024	6	CONDUCTIVITY (1) (VERNIER)	CONDUCTIVITY (1) (VERNIER)	CONDUCTIVITY (2) (VERNIER)	CONDUCTIVITY (2) (VERNIER)
11/3/2024	7	ACID-BASE TITRATION (1)	ACID-BASE TITRATION (1)	ACID-BASE TITRATION (2)	ACID-BASE TITRATION (2)
11/10/2024	8	VETERANS DAY	CALORIMETRY (1) (VERNIER)	CALORIMETRY (1) (VERNIER)	CALORIMETRY (2)* (VERNIER)
11/17/2024	9	REDOX TITRATION (1)	REDOX TITRATION (1)	REDOX TITRATION (2)	REDOX TITRATION (2)
11/24/2024	10	REDOX TITRATION (3)*	LINE SPECTRA	LINE SPECTRA	THANKSGIVING
12/1/2024	11	MOLECULAR MODEL	MOLECULAR MODEL	CHECK-OUT	CHECK-OUT
12/8/2024	12	FINALS	FINALS	FINALS	FINALS

Partial List of Laboratory Safety Procedures

- Students must comply with all safety procedures and precautions when attending a laboratory session.
- There are no provisions for making up a lab; therefore, you are expected to attend all scheduled lab sessions.
- You must have your laboratory procedures written before starting an experiment. Lab notebooks will be checked during lab.
- Laboratory notebooks **must be written in ink**, and all data must be written in the laboratory notebook. Scraps of paper containing data will be confiscated. Do not use “white-out.” Use one line to cross out incorrect data. Chem 1
- The lab lecture will consist of a discussion concerning safety for the experiment being conducted that

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day and information regarding experimental techniques.

- Eating and drinking is not permitted in the lab. **Do not** bring food or drinks to the lab, even if they are in closed/sealed containers.
- If you are pregnant or think you are pregnant, you must consult with your physician before taking this course and performing the laboratory experiments.
- You must wear OSHA-approved safety goggles and gloves at **all times** while in the laboratory. Failure to comply with this rule will result in your being expelled from the course and receiving a grade of "F."
- Appropriate attire must be worn in the laboratory. Shorts, open-toed shoes, and sleeveless shirts ("spaghetti straps") are **not** considered safe clothing for the laboratory. Clothing made of natural fibers are less of a hazard than those made of synthetic fibers.
- Wait to begin the laboratory experiment (e.g., place any chemicals or glassware on the lab benches, turn on Bunsen burners, etc.) until the safety introduction is complete and everyone is wearing their goggles and gloves. The instructor will let you know when to begin the experiment.
- In some cases, it will be necessary for the instructor to examine your "setup" before you begin the experiment. In these instances, the instructor will inform you of proper procedures at the beginning of class.
- Suppose you come into contact with a chemical; flush the affected area with water immediately for 15 minutes. Depending on the degree of contact with the chemical and the location on the body, you may need to do this in the sink or safety shower. When using the safety shower, you must remove the clothing over the area that has come into contact with the chemical. The instructor will ask the other students to leave the room for privacy.
- You will be wearing safety goggles at all times, but should you get a chemical in your eye, flush your eyes in the eye wash for at least 15 minutes.
- If your clothing or hair catches on fire, use the safety shower immediately. If this is not possible, "stop-drop-and-roll."
- If you are hurt or think you have come into contact with a chemical, notify the instructor immediately (or send a lab partner to fetch the instructor) while following proper safety procedures.
- Know where the eyewash, safety shower, and fire extinguishers are located. (You should be able to do this with your eyes closed!)
- Chemicals should never be taken back to your lab bench. They must be kept in the fume hood in their proper storage containers. All substances and waste bottles must be capped after use. **Never** leave a chemical bottle or waste container uncapped.
- If a chemical spill occurs, notify your instructor so that she may help you follow the proper measures for cleaning up chemical spills. All waste must go into appropriate waste containers. Never throw anything down the sink or in the regular trash receptacles.
- Never pick up broken glass with your hands. Always use a brush and dustpan to sweep up broken glassware.
- If at any time the instructor feels that you are being unsafe and have not followed proper safety precautions and procedures, you will be asked to leave the lab. You will receive zero credit for the laboratory report and notebook. You may also be expelled from the course and receive a grade of "F."
- After completing an experiment, clean up your lab space and glassware. Return all cleaned glassware and equipment (e.g., Bunsen burners, clamps, steel rods, etc.) to the appropriate cupboards or stockroom.
- After you have completed an experiment and cleaned up your bench space and glassware, check out with the instructor.
- Remember to wash your hands immediately after completing the experiment and checking out. Also, change your clothes as soon as possible. This is especially important if you have children.

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Lab reports (except for the last one) are due **the Monday after the wet chemistry is complete. No makeup labs are allowed, and no late lab reports will be accepted. All lab reports must be typewritten.**

Student Learning Outcome(s):

- Identify and explain trends in the periodic table.
- Construct balanced reaction equations and illustrate principles of stoichiometry.
- Apply the first law of thermodynamics to chemical reactions.

Office Hours:

T,TH	05:30 PM	06:00 PM	In-Person,By Appointment,Email	SC 1102
T,TH	05:30 PM	06:00 PM	By Appointment,In-Person,Email	SC 2202