

Chemistry 1A, General Chemistry

De Anza College Winter 2023 (1/9 - 3/31/2023)

Class times:

This is a class that meets every Tuesdays and Thursdays for lab and lecture:

section /CRN	Lecture Room G6	Laboratory Room SC2002
CHEM D001A03 / 32191	Tuesdays & Thursdays 11:30-12:45	Tuesdays & Thursdays 7:30-10:20 am
CHEM D001A04 / 32192	Tuesdays & Thursdays 11:30-12:45	Tuesdays & Thursdays 2:30-5:20 pm

Instructor:

Dr. Margarete Leclerc, email: leclercmargarete@fhda.edu

Office Hours: Tuesday/Thursday: 11:00-11:30 and 1:45- 2:30 pm SC1200

Course Description:

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.

This course is divided into two separate instructional periods, the lecture and laboratory sections. The lecture portion is primarily devoted to the material discussion while the laboratory portion gives a chance for students to practice chemical experimentation. One registration code will enroll for the lecture and lab sections. Lecture and lab sections must be taken together to pass Chem 1A and will both go towards a single grade.

Prerequisites:

CHEM 25 or CHEM 30A or satisfactory score on the Chemistry Placement Test; MATH 114 or MATH 130 or equivalent

Advisory: EWRT 1A or EWRT 1AH or (EWRT 1AS and EWRT 1AT) or ESL 5

Required Course Material:

- Lecture Text:** CHEMISTRY: The Molecular Nature of Matter and Change, Silberberg and Amateis, 9e. Other editions will be essentially the same and will work great to study. You can also get an ebook of this textbook. The DeAnza bookstore has two options for the textbook. This text will likely be used by your CHEM 1B and 1C instructors. I will not use the Connect or ALEKS platform, so you can safely get a used book.
- Access to Canvas:** Assignments and some course material will be posted on Canvas and you will need to upload completed assignments to the canvas site. Turn on Canvas notifications to receive class announcements.

3. **Aktiv Chemistry subscription for homework and quizzes.** We will use AktivChemistry as our online homework and in-class practice problem platform this quarter. The homework and the in-class assignments will be graded and contribute to your final grade. You will need to sign up for this subscription through Canvas so that your Aktiv Chemistry account will be linked with our Canvas site. You must sign up for an AktivChemistry account before the second lecture (Thursday) of the first week. After signing up, you will have complimentary access to Chem101 for the first two weeks of the quarter. After this period, you will need to activate your AktivChemistry subscription.
4. **Lab Manual:** A printed copy of the lab manual: <https://www.deanza.edu/chemistry/Chem1B.html>
Lab manuals must be read BEFORE performing each lab. Further instructions in lab section below.
5. **Lab Safety Goggles:** You will need full safety goggles that seal on the sides, not just safety glasses. The goggles need to meet the ANSI Z87.1 or Z87+ specification
6. **Lab Notebook:** Permanently bound, (8 ½) -9" x 11" notebook. NO SPIRAL NOTEBOOK. Make sure it is not spiral bound but permanently bound and larger than the common composition books.
7. **Scientific Calculator.** Logarithm and exponential functions required, No graphing calculators. 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 so be sure to bring a calculator those days.

Registration details:

Class Registration. This class is a lecture and laboratory-based course, so the registration limit is strictly set at 30 students per section based on the number of people able to safely conduct experiments in the space provided.

Dropping the Course. Students that choose to drop this course are responsible for requesting a withdrawal through the admissions and records department **before** the deadline. Students who drop the class are to be also required to officially check-out of the lab locker. Failure to check out by the scheduled check-out date will result in fees and a block placed on future registrations.

Resources: Learn about [Student services](#) Academic support and Information about tutoring can be found at the [Math Science and Technology Resource Center](#) .

Academic Integrity: By enrolling in classes at De Anza College, you agree to the academic integrity policy and are held to all standards. Specifics can be found at [Academic Integrity \(deanza.edu\)](#) and it is your responsibility to understand what academic dishonesty involves. Cheating during an exam or quiz will not be tolerated and will result in zero for that quiz/exam regardless of what percentage of the work is from cheating and the offending student will be reported to the Dean of Student Affairs. For laboratory work you will have to write your own lab report and show your own data analysis even when the data was collected together with a lab partner.

Disability Service Support: De Anza is committed to providing support for students with disabilities. 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](#)

Missing class: If you miss a lab or lecture on the first day of class, you will be dropped from the course unless previous arrangements have been made with the instructor. Regular participation in class is essential for success in class. **Please know that instructors may drop any student who does not participate in the first lab classes. Lab class is in-person and mandatory for this course. Not completing more than two labs will result in an automatic failing grade of F in the course.**

Grades/Evaluations:

Your grade will be determined through assignments and assessments in lecture and lab. Here are the approximate percentages that each assignment groups contributes to the final grade:

Assignment groups	Overall%
Aktiv Homework (10)	11
Aktiv in-class assignments and 3 lecture quizzes	7
Lecture Exams (3)	34
Lecture Final (1)	14
Lecture Total	65
Lab assignments (multiple)	26
Lab final (1)	9
Lab Assignments Total	35
Course total	100

Grade Assignment. Grade cut offs are as follows:

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

NOTE: You must receive at least 55% on the lab assignments **and** homework **and** lecture exams for a passing grade in addition to achieving 70% or higher overall

Assignments fall into the following categories.

Homework through Aktiv. Weekly practice is essential to master chemistry concepts. Before attempting the Aktiv Chemistry homework you need to have practiced solving questions from lecture and from the textbook. The homework on the Chem 101 platform is graded homework and you should use the homework to assess your learning. You will have 2 attempts on the homework. However, make sure that you can solve most homework problems (at least 70%!) without any assistance from notes, the internet, a friend, etc. for success in Midterms and final. If you have difficulty completing the homework questions without assistance, you need to seek out support and/or practice more examples. Completing the homework is strongly recommended and represents the minimum needed to practice the topics. You are strongly encouraged to go beyond the assigned problems and try others throughout the textbook or the supplementary texts.

In class assignments and lecture quizzes: There will be occasional Aktiv Chemistry assignments during class or other assignments throughout the course. Three quizzes will be given between the exams to make sure everyone is keeping up with the material throughout the quarter. The quizzes are worth 15 points each, will take about 15-20 minutes, and will be given at the beginning of class so late attendance may result in missing time for the quiz. The quizzes help you to keep up throughout the course and will alert you if you need to study specific topics again before the midterm exams.

Lecture Exams. There will be three lecture exams to test comprehension throughout the quarter, the dates are indicated in the lecture schedule below. Exams will cover material from lectures, homework, and book chapters. If you have difficulties to complete the homework without outside help you need to get additional support before you take the exam. Questions will range from easy to difficult and may require solving problems that have not been explicitly demonstrated before. Each midterm exam is worth **100 points** and the dates are given in the schedule below. There are no automatic make-

up exams. Missing a midterm will result in zero credit without written proof for an excused absence such as a police report, an official doctors note, etc.

Lecture Final. A comprehensive final will be worth **125** pts and will cover all material from the course but will have more material from Chapter 10 and 11. The time is set by the final schedule for Tuesday 3/28 11:30-1:30. Please do not sign up for this class if you can't make the final time.

Lab assignments. They consist of prelabs, lab quizzes, Lab experimentation which includes data acquisition and calculations, and written conclusions, and a Lab final. More descriptive details are given in the lab section module. The lab points represent 35% of your final grade.

Participation & Attendance & Late Work Policy

Regular lecture participation is highly encouraged. There are no make-ups for missed lecture quizzes or in-class assignments. There are no automatic make-up dates for lecture exams. Please contact me if you have a documented medical or other emergency to address missed exams as soon as possible. You must take the final at the date indicated in the schedules in order to pass the class.

Lab class is in-person and mandatory for this course. Missing three labs will result in an automatic failing grade in the course. Please review the lab description below carefully and approach me with any questions you may have in regard to lab attendance.

Late work is accepted within the grace period indicated on Canvas and Aktiv Chemistry. There is a late submission penalty of 5% each day. The grace period for homework is 4 days and lab analysis and conclusions is 5 days. Each student can twice get the late penalty waved or can request a specific extension.

Class Lecture

This class (Chem 1A) will cover chapters 1-4, and 6-11 from the assigned textbook. The lecture will serve to cover the most important aspects of the chapter. However, students are still responsible **for all material** in the indicated book chapters. More details will be given in the respective Chapter modules on Canvas. Below are four helpful tips that make learning much easier this quarter.

1. Prepare for lecture by reading and previewing the textbook chapter before attending lecture. This will make the presented material much easier to understand and you will be able to engage in exercises and discussion about the material. Pre-reading the textbook before class will allow you to sort the presented information more effectively and therefore will help retain the concepts.

2. Attend lecture. Attending lecture will clarify material and will also include additional active learning activities that will help you make deep connections with the material. In lecture additional information may be presented that is not in your textbook. Also, Chemistry concepts are build on previous concepts and foundational knowledge. If you miss too many lecture classes, you will increase the likelihood that you may fail the class. I will make the slides available through canvas.

3. Review the lecture material and complete practice problems in each sub-chapter we covered as you review material. By engaging with the material through problem solving, you actively learn the material! There is not enough time to go over every concept in detail in lecture, so re-reading the textbook in connection with problem solving is essential to master the concepts. Don't wait until the midterm exam is approaching: Review the material promptly such as within 1 day of the lecture!

4. Each week work out the chapter problems. Plan on spending at least 2-3 hours studying outside of class for each lecture hour (including lab lectures). That's at least 7-10 hours weekly! Extensive practice is the best way to ensure mastering the chem I A material. It is essential to practice the material promptly, so do the Chapter problems **in the same week as the material is covered**. There are plenty of additional problems in the textbook throughout the chapters as well as at the end of each chapter, which will prepare you for midterms and final. I also post practice questions on Aktiv Chemistry.

5. Complete the HW as your self-assessment, treat it as a quiz/exam question. The homework should inform you if you have mastered the concepts of the chapter and uncover gaps you need to work on closing. Ultimately, you will need to be able to solve the questions without assistance from your notes, the textbooks, friends, the internet etc. to score high on the exams.

6. Don't fall behind. Make sure to set aside time to complete your assignments weekly by the due date. Cramming before exams without studying the material during the weeks leading up to an exam does not usually work. Also, in chemistry, each new topic will build on the previous, so it is essential to understand the topics as they are presented (hence do the practice problems). Following a lecture when you do not understand the previous material is not an effective method for learning and will lead to further problems. To avoid falling behind...

7. Get help. If you are having a difficult time with a topic, it is your responsibility to get help promptly. There are plenty of resources for aiding in material comprehension, but it all starts with you making an effort to get this help. You are encouraged to find a study group, working with peers is extremely helpful for mastering material. Also come to office hours to get any follow up questions answered. Lecture and Laboratory Schedule

Tentative schedule subject to change which is announced on Canvas. All dates, including exams are subject to change throughout the quarter. The final exam date will not change.

WEEK OF	WEEK	TUESDAY	THURSDAY
1/8/2023	1	Chapter 1	Chapter 2
1/15/2023	2	Chapter 3	Chapter 3 + Quiz 1
1/22/2023	3	Chapter 4	Exam 1 (1-3)
1/29/2023	4	Chapter 4	Chapter 7
2/5/2023	5	Chapter 7	Chapter 8
2/12/2023	6	Chapter 8	Chapter 9 + Quiz 2
2/19/2023	7	Chapter 9	Exam 2 (4,7,8)
2/26/2023	8	Chapter 6	Chapter 6
3/5/2023	9	Chapter 10	Chapter 10 + Quiz 3
3/12/2023	10	Chapter 10	Exam 3 (6, 9)
3/19/2023	11	Chapter 11	Chapter 11
3/26/2023	12	FINAL 11:30 - 1:30	

Laboratory:

Lab class is twice a week in-person and mandatory for this course. Please refer to the lab schedule below.

You will need to prepare for each of the 11 labs by reading the entire experiment manual available on the De Anza chemistry website. After you read and understand the experiment you will complete a prelab that you then submit to Canvas before your lab time.

At the beginning of the lab period, there will be a 10 min quiz to test how well the procedure has been read and understood. You can reference your prelab and lab notebook during the quiz.

After completing the quiz, we will discuss additional aspects of the lab such as the theory behind the experiment and if necessary, I will demonstrate aspects of the experimental procedure. Missing during the lab quiz will result in zero points for the quiz. Then you will perform the experiment activity and complete the assignment for the specific experiment

Missing the initial discussion and demonstration may prevent you from performing the experiment on that day and will count as missing lab that day. Missing lab will result in a zero for that lab session assignment. Missing three (3) labs will result in an automatic failing grade in the course.

Lab Safety/Preparedness:

Maintaining safety when performing experiments is a primary concern. There are many hazards associated with chemistry labs, so it is essential to recognize these hazards and understand that with proper techniques, the risk drops significantly.

An ACS online safety training assignment needs to be completed by the second lab day of the course on Canvas. Additionally, a mandatory minimum safety requirements document needs to be read, signed, and turned in to a Canvas assignment (5 pts) before performing the first experiment.

Lab Schedule:

WEEK OF	WEEK	TUESDAY	THURSDAY
1/8/2023	1	CHECK-IN	MEASUREMENT
1/15/2023	2	NOMENCLATURE	HYDRATE (1)
1/22/2023	3	HYDRATE (2)	PRECIPITATION (1)
1/29/2023	4	PRECIPITATION (2)	PRECIPITATION (3)
2/5/2023	5	TYPES OF REACTIONS (1)	TYPES OF REACTIONS (2)
2/12/2023	6	CONDUCTIVITY (1)	CONDUCTIVITY (2)
2/19/2023	7	ACID-BASE TITRATION (1)	ACID-BASE TITRATION (2)
2/26/2023	8	CALORIMETRY (1)	CALORIMETRY (2)
3/5/2023	9	REDOX TITRATION (1)	REDOX TITRATION (2)
3/12/2023	10	REDOX TITRATION (3)	LINE SPECTRA
3/19/2023	11	MOLECULAR MODEL	Lab Final/ CHECK-OUT
3/26/2023	12	No Lab	No Lab

Lab Assignments

There will be a total of 11 lab-based exercises this quarter that will loosely correspond to the topics we are covering in lecture. Depending on the lab, the assignments will slightly vary and will carry. All assignments will be assigned on Canvas and detailed instructions will be given in the beginning of the course.

6 Full Labs (total 144 pts): Hydrate, Precipitation, Conductivity, Acid/Base Titration, Calorimetry, Redox Titration. For these six labs, you will read the procedure, complete a prelab, complete a lab quiz, attend the lab introduction at the beginning of the lab period, perform the procedure, answer the follow-up questions/calculations, and write a conclusion.

3 Half Labs (60 pts): Measurements, Types of Reactions, Line Spectra. For these three labs, you will read the procedure, complete a prelab, complete a lab quiz, attend the lab introduction at the beginning of the lab period, perform the procedure and complete a worksheet.

2 Hands-on Lessons (26 pts): Nomenclature and Molecular Modeling: No preparation is needed for these but attending the lesson during the lab period and completing the associated worksheet is required.

Lab Final: (80 pts). The lab final will test your understanding of the theories utilized in lab sections this quarter as well as the calculations implemented to yield meaningful data. This exam will be during your in-person lab time during the last week of class as indicated on the schedule. You may use any notes in your lab notebook you have taken throughout the entire quarter during this test. No early or late exams will be allowed. No working with chemicals required.

Lab Safety/Preparedness

Maintaining safety in a laboratory is a primary concern. There are many hazards associated with chemistry labs and it is important to understand these hazards and that with proper techniques, the risk drops significantly. There are a few, very simple steps students should take to execute safe lab techniques and gain full points for this section.

First, always wear personal protective equipment (PPE) when performing lab experiments. Such items include, but are not limited to, safety goggles, long pants, sleeved shirt, and closed toe shoes. **All of this safety equipment must remain on until you leave the lab, or until everyone has completed the experiment for the day.** A detailed list containing safe lab procedures and general practices is given on the next page and must be reviewed and signed before starting experiments.

Second, read the lab procedure BEFORE coming to lab and write in your notebook the materials needed and step required so that all hazards are known ahead of time and may be properly addressed. Notes, facts, or some recognition of the hazards is required for the prelab to ensure the section on safety has been read. Reading the procedure ahead of time and knowing what tasks are at hand will also help the experiment go smoothly.

Finally, listen carefully to the directions provided at the beginning of the lab session. Many techniques can be performed safely and easily with the proper technique but become a safety hazard when performed improperly. If the lab lecture is missed, the student will not be allowed to perform that lab. As a concern for the environment and to follow county, state and federal law, proper chemical disposal is essential. Students who do not comply with directed procedures may be expelled from the lab or failed in the course for repeated offenses. Check with the instructor if you have any questions.

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	11:00 AM	11:25 AM	In-Person	SC1200
T,TH	01:40 PM	02:25 PM	In-Person	SC1200