

Chemistry 25: Preparation for General Chemistry

De Anza College Fall 2023 (9/25 - 12/15/2023)

Class times:

Section /CRN	Lecture Room SC1102	Laboratory Room SC2208
CHEM D025.21 22997	Monday and Wednesday 08:30-10:20 am	Monday 11:30 am -2:20 pm
CHEM D025.22 22998	Monday and Wednesday 08:30-10:20 am	Wednesday 11:30 am -2:20 pm

Instructor:

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

Office Hours: Monday/Wednesday: 10:20-11:05 and 2:30- 3:15 pm SC1200

Course Description:

This course is an introduction to the core theory and problem-solving techniques of chemistry as preparation for CHEM D001A and CHEM D01AH and other science-related fields, as well as gravimetric and volumetric analysis, rudimentary laboratory equipment and operations, and the preparation and maintenance of a laboratory notebook.

Course Objectives:

1. Explore the core concepts of modern atomic and molecular theory.
2. Assess the importance of the mole concept in stoichiometric calculations.
3. Apply fundamental mathematical concepts to the proper collection and evaluation of experimental data.
4. Explore the various gas laws and understand the relationships between pressure, temperature, and volume of a gas.
5. Differentiate between standard classes of chemical reactions.
6. Acquire an elementary understanding of thermochemistry
7. Explore the discipline of chemistry from a cultural, historical, and societal perspective.

Laboratory Topics Covered:

1. Develop sound laboratory methodology by learning how to maintain a laboratory notebook and writing laboratory reports
2. Familiarize with what chemical safety means by studying Materials safety data sheets (MSDS), learning proper chemical disposal methods and separation of waste streams and thinking about environmental hazard of improper waste disposal

3. Learn to maintain a clean laboratory environment
4. Learn proper way to label chemicals by hazards and learn about secondary containment.
5. Learn to about personal safety in the laboratory by use of safety goggles, by limiting chemical exposure by dressing properly, by learning the locations of safety showers, eyewash stations, and fire extinguishers
6. Learn what to do in Emergency Situations such as fires and earthquakes.
7. Investigate physical measurements including but not limited to gravimetric analysis, and boiling points
8. Get familiar with basic laboratory techniques such as proper way to ignite a bunsen burners, use of pipettes
9. Explore various concepts by carrying out chemical analyses such as: gravimetric analysis of a hydrate, acid-base titrations and use of indicators, determination of density, classes of chemical reactions, physical vs. chemical properties, stoichiometric analysis.

Throughout all topics we will stress both conceptual and mathematical problem-solving techniques in order to prepare students to tackle these topics more in depth in following classes.

Prerequisites:

MATH 114A or equivalent

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

Required Course Material:

1. Text Book: Introduction the Chemistry, 5e, by Bauer, Birk, Marks (McGraw Hill: 2019; ISBN 978-1-307-23515-9) Other editions will be similar and will work to study. You can also get an ebook of this textbook. I will not use the Connect or ALEKS platform, so you can safely get a used book.
2. Lab Text: Lab Manual for Preparation for General Chemistry, Chem 25, by Applegate. (McGraw Hill: 2017; ISBN 978-1-308-68037-8) . Copies are available at the campus book store.
3. **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.
4. **Aktiv Chemistry subscription for homework and quizzes.** We will use AktivChemistry as our online homework and in-class practice problem platform. The homework and the in-class assignments will be graded.. 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 Aktiv Chemistry account before the second lecture of the first week. You will have complimentary 2 week access to Aktiv Chemistry. After this period, you will need to activate your subscription.
5. **Lab Safety Goggles:** You will need full safety goggles that seal on the sides, not just safety glasses. The googles need to meet the ANSI Z87.1 or Z87+ specification
6. **Lab Notebook:** Permanently bound, 7 ½” x 10” notebook. **NO SPIRAL NOTEBOOK.** Make sure it is not spiral bound but permanently bound common note book.
7. **Scientific Calculator.** Logarithm and exponential functions required, No graphing calculators. Phones will not be allowed for calculations during tests so be sure to bring a calculator every day.
8. **Supplemental Texts:** [OpenStax Chemistry, 2nd edition](#). Available free online at openstax online textbook

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.

Course drops, withdrawals, and other deadlines

All registrar deadlines for winter quarter are as follows:

Adding the course	Friday October 7
Dropping the course without a W	Sunday October 8
Dropping the course with a W	Friday November 17

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](#) 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: You are responsible for all the material covered in this course, and it is expected that you attend and participate in all of the lecture and laboratory sessions. 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 can drop students who miss class in the first two weeks of the quarter.**

Lab class is in-person and mandatory for this course. Not completing 3 or more labs will result in a failing grade 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	Approximate Overall %
Aktiv Homework (10)	11
Aktiv in-class assignments and lecture quizzes	8
Lecture Exams (3)	35
Lecture Final (1)	16
Lecture Total	70
Lab assignments (multiple)	22
Lab Final (1)	8
Lab Assignments Total	30
Course total	100

Grade Assignment. Grade cut offs are as follows:

A+ (97), A (93), A- (90), B+ (87), B (83), B- (80), C+ (75), C (69), D (55), F (<55)

NOTE: You must receive at least 55% on the lab assignments **and** homework **and** lecture exams for a passing grade of C in addition to achieving 69% 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 at 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. 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. Each midterm exam is worth **100 points** and the dates are given in the schedule. 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. The time is set by the final schedule for Wednesday 12/13 7:00-9:00 AM. 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 reports which will be a mixture of worksheets and discussion submissions and a Lab final. The lab points represent 30% 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 on Canvas and Aktiv Chemistry. Aktiv HW has due dates, Lab reports are due a week after the lab session. There is a late submission penalty of 5% each day after the due date. Lab reports are accepted up to 1 week late. Each student can twice get the late penalty waved or can request a specific extension.

Class Policies

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 built on previous concepts and foundational knowledge. If you miss too many lecture classes, you will increase the likelihood that you may fail the class. Be ready to start class at the scheduled time. Please arrive on time and plan on staying the entire session as late arrivals and early departures distract everyone. Please turn OFF your cell phone when you enter the class or lab. You may NOT take calls or texts during either, except for emergencies.

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 8-10 hours weekly! Extensive

practice is the best way to ensure mastering the Chemistry 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 is 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. **Come to office hours** to get any followup questions answered.

Laboratory:

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

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. The lowest lab report grade will be dropped.

LABORATORY PROCEDURES AND POLICIES

All students are expected to arrive to lab on time and to come to lab prepared to carry out the experiment scheduled for that session. This means that you have studied the experiment for the day, have a basic understanding of its purpose and procedure, and have prepared your laboratory notebook for the experiment prior to the start of lab.

LABORATORY SAFETY

Laboratory safety is an everyday assignment. Being safe in the lab is a top priority. The importance of safety in the laboratory will be reviewed the first day of lab. Any unsafe behavior, intentional or not, will be noted and may be cause for dismissal from the class. For your protection, safety goggles with indirect ventilation and an ANSI minimum rating of Z87 must be worn AT ALL TIMES in the laboratory.

LABORATORY LECTURE

The beginning of each laboratory session is designated as a laboratory lecture period for which you must be on time in order to perform the scheduled experiment. The instructor will use this lecture period to outline important details of the procedure, overview theory and calculations, and to emphasize safety hazards and proper chemical disposal. If you are more than 10 minutes late for lab lecture, you will not be allowed to do the experiment for that day.

ATTENDANCE

Attendance is required at all scheduled laboratory sessions. You will receive a zero on the second lab you miss and will fail the course on the third. These absences include those in which you arrive too late for lab lecture and are thus not allowed to complete the experiment. I may allow for emergencies and other complications in life. Additionally, do not plan on leaving lab early. Labs will regularly take the total amount of time allotted.

CHEMICAL DISPOSAL

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.

LAB REPORTS

All lab reports must be completed and turned in to receive a passing grade in this class. Using another student's data or making up data is plagiarism and data falsification and will result in a zero for the assignment and referral to the dean. In cases where a student was unable to complete a lab, the instructor may direct you to use another's data in order to complete follow up quests at his discretion. The source of your data must always be cited in lab reports.

LATE ASSIGNMENTS

Due dates for assignments are listed on the class schedule. It is the student's responsibility to know when labs are due based on the provided class schedule.

EXCUSED ABSENCE

Every student gets one excused absence. To reflect this, your lowest pre-lab and lab report are dropped at the end of the quarter. Missing a 2nd lab will result on a score of zero on that lab. Missing a third will result in failing the course.

Lab Schedule:

WEEK OF	WEEK	Monday / Wednesday
9/24/2023	1	CHECK-IN
10/1/2023	2	MEASUREMENTS
10/8/2023	3	DENSITY & GRAVITY
10/15/2023	4	ATOMIC STRUCTURE & PERIODIC TABLE
10/22/2023	5	IONIC COMPOUNDS
10/29/2023	6	EMPIRICAL FORMULAS
11/5/2023	7	CHEMICAL REACTIONS
11/12/2023	8	COVALENT COMPOUNDS
11/19/2023	9	<i>MOLAR VOLUME**</i>
11/26/2023	10	VINEGAR ANALYSIS
12/3/2023	11	Lab Final CHECK-OUT
12/10/2023	12	Finals week

Student Learning Outcome(s):

- Assess the fundamental concepts of modern atomic and molecular theory.
- Evaluate the standard classes of chemical reactions.
- Demonstrate a fundamental understanding of mathematical concepts pertaining to chemical experimentation and calculations.

Office Hours:

M,W	10:20 AM	10:05 AM	In-Person	SC1200
M,W	02:30 PM	03:15 PM	In-Person	SC1200