

Welcome to Chemistry 141: General Chemistry I

In Chemistry 141, we will build on the knowledge that you have acquired from Chemistry 120: Prep for General Chemistry, including, but not limited to, problems in stoichiometry, solution concentration, gas laws, and nomenclature of common inorganic compounds and writing their formulas. We will continue to use basic laboratory equipment such as balances, burettes, pipettes, graduated cylinders, etc., and introduce basic data acquisition devices. We will spend the first four weeks of the course reviewing basic material and deepening that knowledge. Following this, new topics will be introduced.

The course consists of three hours of lecture instruction and six hours of laboratory per week. Students from previous classes would encourage you not to miss class because you will have missed instruction, class discussion, explanations, activities and learning that cannot be replicated outside of class. ***Outside of class, please plan to spend, on the average, two hours per lecture hour and one hour per lab hour per week additional study time.*** Outside activities include, but are not limited to, reading the chapter, reviewing lecture notes, doing homework problems, quizzing yourself, preparing for lab, and writing lab reports.

Course Syllabus

Course Information

Course: Chemistry 141
Section: 0075
Lecture: MW 8:00-9:15 am Room 34-170
Lab: TTh 8:00-10:50 am Room 30-240

Instructor Information

Instructor: Diana Vance
E-mail: diana.vance@gcccd.edu
URLs: www.grossmont.edu/dianavance
Phone: 619-644-7047
Office: 30-224
Office Hours: M 9:30-10:50 pm
W 9:30-11:50 pm
TTh 11-11:50 pm in office or Chemistry computer lab 30-252
Other times by appointment

General Information

Prerequisites: Grade of “C” or higher in Chemistry 120 or equivalent or the Chemistry 141 assessment and a “C” grade or higher or “Pass” in Mathematics 110 or equivalent.

Text: *Chemistry, A Molecular Approach* 4th edition or custom Grossmont edition, by Nivaldo J. Tro
MasteringChemistry account (available with new books or bought online from publisher)

Optional: Study Guide for above text.

Lab: 141 Laboratory Manual
Quadrille-ruled, double-entry notebook
A pen with nonerasable blue or black ink is required for the recording of all laboratory data.
Safety Glasses (Z-87) - available in bookstore and hardware stores.
Sharpies
USB flash drive

Additional requirements: Calculator - A standard scientific calculator is required for the course.

Tips for Success

1. Believe in yourself! Everyone makes mistakes, be sure to learn from them.
2. Come to class every day and be prepared and engaged.
 - a. Pre-read the textbook to get an idea of the material being covered in the days lecture and/or lab. What questions do you have?
 - b. During class, everyone is expected to participate actively in class. Although, this does not mean that you must raise your hand every single class period, it does mean arriving on-time and prepared, paying attention, and being engaged during lecture and lab.
 - c. Review your lecture notes after class as soon as possible. Was there a concept or problem that needs clarification?
3. Seek help when you need it.
 - a. Visit me during my office hours. I encourage all students to come and visit me during my office hours, especially if you have any questions or concerns about the course. If you want to work on a lab report, please bring your data, analysis, and draft. If you have questions on the homework, bring specific problems and your notes. Come during the first week of class for five bonus points on your first exam.
 - b. Have questions outside of class or office hours? Email me. Please allow at least twenty-four hours for a response. If you are emailing about a homework problem, the more details you give the better, such as the problem number, where you are getting stuck...Screen shots are also helpful.
 - c. Ask questions during lecture and lab. I'm here to answer your questions about chemistry.
 - d. Form an informal study group of two, three, or four students, who meet regularly to work on homework, study for quizzes, tests, etc.
 - e. Go to tutoring. There is a free by appointment tutoring service in the library building, and walk-in tutoring during "open" help times in the Science Learning Center (30-252). The SLC schedule is posted on the door.
4. Stay in close communication with me and your classmates, especially when absent.
5. Start working on homework, lab reports, and studying for exams and quizzes early.
 - a. Do all the homework and do it thoroughly. Have questions? Ask me! Ask a classmate! Ask a tutor! Ask another instructor! We are all here to help you learn chemistry.
 - b. Start analyzing your lab data as soon as you collect it. When you have questions, you will have plenty of time to get them answered. Write a rough draft of your lab report to get feedback before you turn it in for grading.
 - c. Work the previous exams and quizzes before looking at the key to grade yourself. What concepts/problems do you need to practice more? Remember that your exam will not be exactly the same as previous ones, but they will give you a sense of the wording and types of questions.

In addition, former students will tell you that it is important to have a working knowledge of intermediate algebra and be able to read, write, and comprehend English at a technical level equal to that found in the text for the course. You will be expected to apply algebra topics such as solving simultaneous equations, graphing of various functions and the algebra of logarithms. Being able to communicate what you have learned in writing is also important for lab reports, homework, exams, quizzes, and other assignments.

Classroom Policies

To help create a positive classroom environment and be successful in this course, please keep the following guidelines in mind:

- **Productive conversations:** This course has both a lecture and a laboratory component. It is vital that you always listen and speak respectfully to each other. It is the experience of this instructor that students who form a community are more successful. During lecture and lab please keep conversations related to the material being covered.
- **Technology use:** During lecture please have your phones put away so that you can focus and be successful in class. If you need to take an important call or text, you are free to step outside. Laptops and headphones should be stored away during class time, unless an exception is made. During lab it can be helpful to take

pictures of the progress of the experiment. Be sure not to take pictures or video of other students without their consent. To videotape or record your instructor you must obtain written consent.

- **Collaboration:** We will engage in a lot of collaborative activities in this class particularly during lab. Please participate fully in group work and be an engaged team member. You all have valuable thoughts and perspectives to share. When working together be sure to acknowledge the ideas, writings, or materials of someone else.
- **Attendance:** Your attendance is necessary to ensure your success. Regular attendance is expected (A roll sheet may be passed around at each class.). In the event you are sick, or another emergency comes up please stay in close communication with me. If you know that you will be absent, come see me so that you can find out what you missed and continue to be successful in the course. The instructor may drop any student who misses over (4) classes. (BUT this is not a guarantee!) If you wish to drop, you should turn in the forms and get a receipt.
- **Registration:** Registration should be completed before checking into lab. If registered late, bring your validated receipt to lab. To make an appointment to check out call the Chemistry Department Stockroom at 619-644-7339.
- **Overarching Policy:** Any behavior that interrupts learning or negatively affects the classroom environment breaks the Grossmont College Student Code of Conduct and will be dealt with directly. Cheating and plagiarism include, but are not limited to, possession or use of unauthorized materials such as crib notes or unauthorized copies of exam materials, copying from another person's quiz, exam, lab data, or report or allowing another person to copy your data, using a calculator or computer which contains stored information during an exam or a quiz, submitting a false report for work that was not actually done by you during the current semester, modifying or attempting to modify an answer on an exam after it has been returned and then claiming it was graded incorrectly. Engaging in academic dishonesty so can result in a variety of sanctions, including, but not limited to an adjusted grade on an exam, quiz, paper, project, or assignment of a failing grade in the course.

Grossmont College Student Discipline Policy

If a student is engaging in behavior that leads to an unproductive classroom environment or violates the Student Code of Conduct, it will lead to the following:

1. a verbal warning;
2. a written warning; and
3. a two-day classroom removal, which could result in being dropped from the course. (Note: The student must meet with the Assistant Dean of Student Affairs before being allowed to return to class.)

For the full Student Code of Conduct (that includes other behavioral policies and an explanation of your rights as a student), please go to "Student Rights and Responsibilities" on the Grossmont College website.

Student Learning Outcomes

This course is both a lecture and a laboratory course. The major goals for the semester are to become fluent in the language of chemistry and to utilize the tools of chemistry to analyze a variety of chemical phenomena. The behavior of substances will be explored in the laboratory, and you will use your knowledge of chemistry to explain the behavior. In particular, each student should be able to do the following upon completion of this course:

- a. Demonstrate a working knowledge of the language of chemistry.
- b. Apply quantitative reasoning to chemical problems
- c. Apply a laws and theories to explain and predict the properties of atoms and molecules.
- d. Employ laboratory equipment and techniques to collect, organize and evaluate experimental data.

Course Objectives

The student should be able to:

- a. Solve stoichiometry problems involving mass, moles, mixtures, gas volumes, and limiting reactants.
- b. Solve gas problems using the ideal gas, combined gas, Dalton's partial pressure, and Graham's effusion laws.
- c. Demonstrate proficiency in chemical nomenclature.
- d. Identify and balance net ionic equations for oxidation reduction, acid base and precipitation reactions.

- e. Demonstrate quantitative and qualitative understanding of chemical equilibrium.
- f. Demonstrate understanding of chemical periodicity in terms of quantum mechanics and atomic structure.
- g. Analyze the bonding in chemical compounds in terms of Lewis structures, VSEPR, valence bond theory, molecular orbital theory.
- h. Calculate enthalpies of reactions using Hess' Law, bond energies, and calorimetry.
- i. Apply the first and second laws of thermodynamics to chemical systems.
- j. Solve colligative property problems and explain solution properties in terms of vapor pressure and intermolecular interactions.
- k. Demonstrate ability to analyze a phase diagram.
- l. Apply science methodology in a laboratory setting.
- m. Demonstrate proficiency in quantitative chemical analysis techniques.
- n. Apply kinetic molecular theory to describe the properties of solid, liquids and gases.
- o. Demonstrate correct documentation of experimental data in laboratory notebook and presentation of analysis in a formal lab report.
- p. Solve problems involving the relationship of pH, pOH and K_w in aqueous solution.

Grading Criteria

Your final grade will be approximately 75% from the lecture and 25% from the laboratory portion of the course. Approximately 88% will be an A, 78% a B, 68% a C and 55% a D grade. Please note however that anyone with less than a 50% average on the exams (including final), or on the labs will receive an F.

The approximate grade breakdown is:

Quizzes	15%
Homework	10%
Lab Experiments	25%
Exams	35%
Final Exam	15%

All grades may be subject to a (+/-) 1-2% instructor evaluation of the student, which may be based on homework, class participation, etc... All course assignments must be turned in no later than the start of the final examination in order to be considered for credit.

Those enrolled at the end of the semester must receive a letter grade unless they have chosen the CR/NC option. An "incomplete" may be arranged for completion of an item, such as the final exam, but will not be given to allow a repeat of the course. Withdrawal or CR/NC grading is available through Admissions and Records.

Quizzes:

Quizzes will be given in lab. There will be 9 - 12 quizzes given over the course of the semester and 1 or 2 may be dropped at the instructor's discretion. Material from both laboratory and lecture may be included. Much of the material on the quizzes will be similar to the material found in the assignments. No make-ups are given for missed quizzes. This allows me to give feedback on the quizzes as quickly as possible. Missed quizzes will count for zero points and be counted as low scores when dropping quizzes.

Exams:

Exams will be given in the lab as noted in the schedule. Please do not miss these examinations. *Make-up exams will only be given with an acceptable and verifiable excuse within **one week** of the scheduled exam.* It is the student's responsibility to arrange a make-up exam within one week of the original test date. Please notify the instructor before the missed exam or within two school days after the exam preferably via email, so that accommodations can be made. Please note that make-up exams may not be the same exam given to the rest of the class and may be more difficult than the regularly scheduled exam. No make-up final will be given, so please set your schedule accordingly. This allows me to submit final grades in a timely manner. You will be asked to schedule your make-up exam at the Testing Center.

Assignments:

These include computer exercises and homework.

- Computer homework – Mastering Chemistry is computer graded exercises and homework via the world wide web. These are computer graded homework assignments that are available via the internet. To register for the on-line computer assignments, go to Canvas, <https://gcccd.instructure.com/>, and click on the Mastering Chemistry link.
 - You will be prompted to enter the code you received at the bookstore with your text book. If you are using only the online text you can pay for it at this point or sign up for the free 2-week trial. After the end of the trial you will need to submit either a code or pay for access for the remainder of the semester. (Note that you have the option of buying Mastering Chemistry only or the combination of the online book and Mastering Chemistry.)
 - Once you have registered for the class you will see the homework assignments and their due dates. The homework assignments correlate to the problems in the book, but the numbers may change from the book on the calculated questions.
- For additional practice, it is highly recommended that you complete all odd end of chapter problems.

Laboratory Work:

Lab is where you get to apply all of the laws and theories that you have been learning about it lecture. Your laboratory work must be done and completed during your regularly scheduled time, and the reports must be turned in to pass the course. The laboratory portion of the grade will depend on experimental technique, lab etiquette, and the lab reports.

Before coming to lab:

1. Read the lab experiment that you will be doing (i.e. background and procedures).
What questions do you have? Is there anything that is not clear? Make sure you ask your instructor during the pre-lab lecture.
2. Complete your experimental pre-lab. At a minimum fill out the header, write a title, objective, procedure reference, safety, and waste treatment. Previous students will tell you that writing out your procedures, in your own words, and drawing data tables helps you to be more efficient and organized during lab. You will write either a running log or a procedure summary/observations for the experiment. You want to understand what you will be doing before you do it.
Unsure of what to do? Ask me! I'm here to help you.

Your instructor will check your lab notebook for completion before you start the experiment. If your pre-lab is not complete, you will be asked to leave lab until such time as you are prepared to start the lab. Additional time will not be allotted if you are unprepared.

During lab:

3. Please plan to stay the entire laboratory period. If you finish experimenting, start working on the calculations and questions.
4. Safety is one of the most important parts of working in a laboratory. We will cover proper technique when handling glassware, chemicals, etc. Remember to follow basic laboratory protocols:
 - a. Always wear eye protection (without reminders from the instructor).
 - b. Wear appropriate clothing- closed-toe shoes, long pants, no sleeveless tops, no dangling jewelry or neckties etc. Remember that eating, drinking or gum chewing in the laboratory can result in exposure to chemicals;
 - c. Tie back long hair;
 - d. Use proper technique when handling glassware (we will review new techniques);
 - e. Properly clean up any minor chemical spills; report major spills to the instructor;
 - f. Clean up your hood space and put away your equipment at the end of lab, turn off gas, and lock your locker.

When you have questions ask me! I'm here to help you learn chemistry.

5. Record your data (i.e. observations and numerical values) directly on the lab pages in permanent blue or black ink. Don't worry about making a mistake; just cross it out with a line and write the proper value near it. As scientists, it is important to keep accurate records of our experiments. Data recorded on other pieces of paper will be confiscated.

Have questions during the experiment? Ask me! Ask your classmates!

6. At the end of the period, clean up your work area (i.e. bench top, chemical hood) and the common areas, turn off gas, lock your locker. Did you wipe down your bench including the walls and ceiling of the chemical hood? Did you make sure the reagents are organized for the next period? What about the balances and sinks?
7. Your instructor will initial your completed data once your work area and the common areas are clean. Once the instructor has signed your lab pages you may leave lab for the day.

After lab:

8. You will organize, analyze, and evaluate your laboratory data and write a lab report. The purpose of writing a lab report is to prepare you to write technical papers for journals, grants for funding, and learn to communicate scientific information to peers and the general public.
Start working on your report right away. Do not procrastinate; that makes it harder to get help when you need it. Have questions? Come to office hours, email me, ask your classmates, go to tutoring.
9. Lab reports are due one week after the period in which they are scheduled to be completed. To receive credit for lab reports, they must be submitted on-time and to VeriCite on Canvas to check for plagiarism (when appropriate) by the due date and time. Lab assignments support the material being covered in lecture. To ensure that students receive timely feedback on their lab reports from their instructor, help students keep up with lab assignments, and avoid procrastination late laboratory assignments are not accepted. Revisions are not permitted, but once I grade your report be sure to answer the reflective questions to help you improve subsequent laboratory reports and earn up to five bonus points on that report.

Other Support Services

Free tutoring on campus:

- By appointment tutoring in the library building (70-202):
<https://grossmont.edu/student-services/tutoring/tutoring-center.aspx>
- Walk-in tutoring in the Science Learning Center (30-252). The schedule is posted on the door.

Success Coaches: Have difficulty in any of your classes? Feeling overwhelmed? Finding it hard to manage your time? Facing issues that are affecting your academics? Grossmont College has success coaches that you can meet with for one-on-one, private guidance. You can reach out to them at grossmont.gradcoach@gcccd.edu or text them at 619-738-3380.

Accommodations for Students with Disabilities: *Students with disabilities who may need accommodations in this class are encouraged to notify the instructor during the first two weeks of class and contact the Accessibility Resource Center (A.R.C.) early in the semester so that reasonable accommodations may be implemented as soon as possible. Students may contact A.R.C. in person in building 60 room 120 or by phone at (619) 644-7119 or (619) 644-7119 TTY for deaf.*

Food or housing insecurity: Contact a Grossmont College Basic Needs Liaison (their names are listed in the web link provided below) or you can send an e-mail to Grossmont.BasicNeeds@gcccd.edu to request information or assistance. **Additional information on basic needs resources:** including Student Health Services, Personal Counseling, Gizmo's Kitchen (Grossmont College's food pantry) is available at: <https://www.grossmont.edu/student-services/offices-and-services/basic-needs/>

I RESERVE THE RIGHT TO MAKE CHANGES TO THIS SYLLABUS AS THE CLASS OR I SEE FIT.

141 Tentative Schedule – Spring 2020 – Section 0075 (I reserve the right to make changes.)

Week	Chapter and Topic	Lab Experiment
01-27-20	1 – Matter, Measurement, and Problem Solving	Nomenclature/Significant Figures Review/Check-in Exp 1 – Calibration of Glassware
02-03-20	2 – Atoms and Elements <i>February 9th Last Day Drop without a W</i>	Exp 1 – Calibration of Glassware Exp 2 – Propagation of Error
02-10-20	3 – Molecules, Compounds, and Chemical Equations <i>Holiday – Fri, Sat</i>	Exp 8 – Copper Lab
02-17-20	<i>Holiday – Monday</i> 4 – Chemical Quantities and Aqueous Reactions and Ch 19.2 Redox Reactions	Exp 5 – Conductivity
02-24-20	5 - Gases	Exp 6 – Writing Redox Reactions Exp 7 – Redox Reactions – Activity Series
03-02-20	6 – Thermochemistry	Exam 1 (Chapters 1, 2, 3, 4) Exp 9 – Analysis of a Two-Component Alloy
03-09-20	7 – The Quantum-Mechanical Model of the Atom	Exp 9 – Alloy cont. Exp 10 – Calorimetry – Measuring Heat of Formation
03-16-20	8 – Periodic Properties of the Elements	Exp 10 – Calorimetry cont. Formal Lab Report Review – Bring 2 Printed Copies (Alloy Experiment)
03-23-20	<i>Spring Break Holiday</i>	<i>Spring Break Holiday</i>
03-30-20	9 – Chemical Bonding I: The Lewis Model	Exp 11 – Atomic Spectra Exp 12 – Periodicity of Chemical Properties
04-06-20	10 – Chemical Bonding II: Molecular Shapes, Valance Bond Theory, and Molecular Orbital Theory	Exam 2 (Chapters 5, 6, 7) Exp 13 – Molecular Structure
04-13-20	10 – Chemical Bonding II: Molecular Shapes, Valance Bond Theory, and Molecular Orbital Theory	Exp 13 – Molecular Structure cont. Exp 14 – Identification of an Unknown Acid
04-20-20	11 – Liquids, Solids, and Intermolecular Forces <i>Friday, April 26th Last Day to Drop with W</i>	Exp 14 – Identification of an Unknown Acid cont. Exam 3 (Chapters 8, 9, 10)
04-27-20	12 – Solids and Modern Materials	Lecture Catch-up Element Presentations
05-04-20	13 – Solutions	Exp 16 – Determination of Molar Mass by Freezing Point Depression
05-11-20	15 – Chemical Equilibrium	Exp 17 – Chemical Equilibrium and Le Châtelier's Principle cont. Le Chât Presentations
05-18-20	15 – Chemical Equilibrium cont.	Problem Session/Lecture Catch-Up/Check-out Exam 4 (Chapter 11, 12, 13, 15)
05-25-20	<i>Holiday – Monday Final Exam – Tuesday, May 26, 2020 9:25-11:25 am in 30-240</i>	