

South Plains College
Common Course Syllabus: CHEM 1412
Revised August 2026

Department: Science

Discipline: Chemistry

Course Number: CHEM 1412

Course Title: General Chemistry II

Instructor:

Dr. Laci Alexander

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Office Hours: Monday: 8:30 am – 9:30 am

Tuesday: 8:30 am – 9:30 am; 1:30 pm – 2:30 pm

Wednesday: 8:30 am – 9:30 am

Thursday: 8:30 am – 9:30 am; 1:30 pm – 2:30 pm

Friday: 9 am – 11 am

You may also make an appointment for office hours using the following link:

[Calendly Office Hours](#)

Available Formats: Face to Face, Hybrid, Online

Campuses: Levelland

Course Description: Chemical equilibrium; phase diagrams and spectrometry; acid-base concepts; thermodynamics; kinetics; electrochemistry; nuclear chemistry; an introduction to organic chemistry and descriptive inorganic chemistry. Basic laboratory experiments supporting theoretical principles presented in lecture; introduction of the scientific method, experimental design, chemical instrumentation, data collection and analysis, and preparation of laboratory reports.

Prerequisite: A grade of "C" or better in CHEM 1411.

Credit: 4 **Lecture:** 3 **Lab:** 3

Supplies:

Safety Goggles – Required, obtained from bookstore

Calculator – Required, must be scientific, **CELL PHONES NOT ALLOWED**

Lab Kit-Ordering instructions can be found on blackboard.

This course partially satisfies a Core Curriculum Requirement:

Life and Physical Sciences Foundational Component Area (030)

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions
- **Teamwork**—to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Student Learning Outcomes:

From Lecture:

1. Physical Properties of Solutions
 - a. Understand the definition of a solution and how a solution forms from a molecular point of view; to learn the different types of solutions
 - b. Learn the various methods of calculating the concentration of a solution and the corresponding units that go along with each method
 - c. Learn how temperature affects the solubilities of substances and how pressure affects the solubility of gases in solution
 - d. Understand the colligative properties of solutions and how to calculate changes in the freezing point and boiling point of a solution
2. Chemical Kinetics
 - a. Learn what the rate of a reaction means, how to determine it, and how to write the rate law for reactions
 - b. Understand the relation between reactant concentration and time, and how to calculate concentrations and times
 - c. Study the definition of activation energy and understand how rate constants are dependent on temperature
 - d. Discover how to determine a likely reaction mechanism
3. Chemical Equilibrium
 - a. Discover what chemical equilibrium is and study how to write an equilibrium expression using the law of mass action
 - b. Study about homogeneous and heterogeneous equilibria and how these affect the equilibrium expression

- c. Discover the difference between the equilibrium constant and the reaction quotient and how these are used to predict the direction a reaction will proceed to reach equilibrium
 - d. Calculate the equilibrium constant using given equilibrium concentrations and calculate equilibrium concentrations given the equilibrium constant
 - e. Learn what factors affect equilibrium
4. Acids and Bases
- a. Discover the Bronsted-Lowry and Arrhenius definitions of acids and bases as well as how to determine which compound is the acid or base
 - b. Learn the acid-base properties of water and how the ion-product constant of water is determined and used
 - c. Study pH and how it is calculated
 - d. Distinguish between strong acids/bases and weak acids/bases and learn how to calculate the pH of these acids and bases using ionization constants when necessary
 - e. Understand the acid-base properties of salts and how to calculate the pH of a salt solution
5. Acid-Base Equilibria and Solubility Equilibria
- a. Learn about the common ion effect and how the Henderson-Hasselbalch equation can be used to calculate the pH of solutions that have a common ion
 - b. Discover buffers including their definition, calculation of their pH, and the preparation of one
 - c. Study about acid-base titrations and the calculation of pH at different points during a titration as well as learning about indicators that can be used during a titration
 - d. Understand solubility equilibria and distinguish between solubility and molar solubility
 - e. Perform calculations involving the solubility product constant and study how the common ion effect affects solubility
6. Thermodynamics
- a. Discover what a spontaneous process is
 - b. Learn about entropy including the second and third law of thermodynamics and to perform entropy calculations
 - c. Understand the meaning of Gibbs Free Energy, perform Gibbs Free Energy calculations and to learn how the free energy change affects spontaneity
 - d. Discover how free energy and chemical equilibrium are related
7. Electrochemistry
- a. Learn about redox reactions and how to balance them using the half-reaction method

- b. Learn about voltaic cells and how to write cell diagrams
 - c. Study about standard reduction potentials including their use in calculating cell voltages
 - d. Explore the spontaneity of redox reactions and how standard cell voltages, equilibrium constants, and standard free energy changes are related
 - e. Understand what affect concentration has on cell voltage and perform related calculations
 - f. Study about corrosion
8. Nuclear Chemistry
- a. Distinguish between nuclear and chemical reactions
 - b. Study the types of particles involved in nuclear reactions as well as how to use them to balance nuclear reactions
 - c. Study about nuclear stability and how this affects radioactive decay
 - d. Learn about natural radioactivity and the kinetics of these processes
 - e. Distinguish between nuclear transmutation, nuclear fission, and nuclear fusion

From Lab:

1. Safety Orientation
 - a. Demonstrate the fundamentals of laboratory safety including the use and location of safety equipment
2. Calculations involving solutions
 - a. Demonstrate knowledge of calculations involving solutions
3. Freezing point depression
 - a. Perform or view a demonstration of a freezing point depression experiment including calculations of molar mass with data collected
4. Molar mass by the boiling point method
 - a. Perform or view a demonstration of an experiment that uses boiling point elevation data to determine molar mass
5. Kinetics
 - a. Perform or view a demonstration of an experiment that employs the use of spectrometer data to determine the order of a reaction
6. Acids and Bases
 - a. Demonstrate knowledge of acids and bases by calculation of their pH's
7. Weak acid ionization constant
 - a. Perform or view a demonstration of an experiment that uses titration data collected from pH meters to calculate the ionization constant of a weak acid
8. Common ion effect
 - a. Perform or view a demonstration of an experiment that uses titration data to prove the common ion effect

Student Learning Outcomes Assessment: 2-3 questions from each semester will be randomly selected from the regular exams. These will pertain to a pre-selected topic and will be used to determine the extent of improvement that the students have gained during the semester.

Course Evaluation

- **Major Exams**
 - There will be four major exams throughout the semester, each worth 100 points (with opportunities for bonus points).
 - To keep everyone on track, make-up exams will not be offered, so please plan ahead and communicate with me early if conflicts arise. See policy below for specific examples for make-up exams.
 - You may use a calculator (after clearing its memory and showing me before the exam begins).
 - A reference/formula sheet will also be provided or permitted so you can focus on applying concepts rather than memorizing every detail.
- **Final Exam**
 - The final exam is comprehensive and optional. Think of it as an extra opportunity—you can use it to replace your lowest exam grade if it helps your overall average.
 - The final exam is open note, so your own well-organized notes will be a valuable tool.
 - Finals are scheduled by the college, and you'll take it at the assigned time.

Remember: Exams are not meant to trick you—they're designed to highlight what you've learned and how you're growing as a problem solver. With consistent effort, preparation, and the resources provided, you'll be ready to succeed.

Reference Sheets

- For each major exam, You may use one 3×5 notecard (both sides) for Exams 1–4.
- Cards may be handwritten or typed.
- Allowed content includes formulas, constants, and definitions or other instructor-approved information.
- Prohibited content: No worked examples from class notes, worksheets, practice problems, or online sources. No questions should be written on the notecard.
- Violations:
 - Unauthorized content will result in point deductions based on the severity of the infraction.
 - Any bonus points for that exam will also be forfeited.
 - Inclusion of unapproved material constitutes academic dishonesty and will be subject to the cheating policies outlined in this syllabus.

Exam Make-Up Policy

Because this course is fully online, each exam is available for an entire week, giving you a wide window to plan around work, family, travel, and unexpected events.

For that reason:

No Make-Up Exams Are Offered

Make-up exams are not available for any reason except a documented medical emergency that prevents you from completing work for multiple days (such as hospitalization).

If you miss an exam without qualifying documentation, the grade will remain a zero.

Exceptions: Documented Hospitalization or Serious Emergency**A make-up exam *may* be approved only if:**

- You experienced a hospitalization or major medical emergency, OR
- You have documentation showing you were physically unable to complete coursework for an extended period during the entire exam window.

Required documentation:

Hospital discharge paperwork, doctor's note stating you were unable to complete online work, or other official documents.

If approved, the make-up exam:

- Must be completed by a deadline set by the instructor
- May be offered in a different format
- Will not be automatically granted—approval is based on documentation

Final Exam Policy

- The final exam is required for all students.
- Since the final exam window is also open for several days, make-ups for the final follow the same rule:

Only documented hospitalization or extreme circumstances *may* qualify.

- All approved make-ups must be completed by the last official day of finals week at 3:00 PM, or they will be recorded as a zero.

In extremely rare cases where completing the final is impossible (such as extended hospitalization), students may be evaluated based on existing coursework — only if allowed by SPC policy, and only with documentation.

Communication Is Essential

Life happens — but you must contact me as soon as possible if an emergency occurs. The earlier you reach out, the more options we may have.

Please remember:

- I can see when you log in, how long you work, and whether you attempted the exam.
- "Technical issues," travel, work schedule, or waiting until the last day of the exam window do not qualify for make-ups.

Laboratory Policies, Safety, and Good Practices

Even though this course is fully online, the laboratory component is still a vital part of learning chemistry. Your at-home lab kit allows you to explore real scientific ideas in a

hands-on way — and safe habits matter just as much at home as they do in a traditional lab.

Working carefully, staying organized, and following instructions closely will help you stay safe and get the most out of each experiment.

Proper Lab Setup & Safety — Even at Home

Before you begin any experiment at home, make sure your workspace is safe and your materials are ready.

Required At-Home Lab Safety

- Wear safety glasses during every experiment — no exceptions.
- Work in a clean, well-lit, stable area away from food, pets, and children.
- Keep your workspace free of clutter, especially around liquids or heat sources.
- Tie back long hair and avoid loose sleeves or dangling jewelry.
- Never eat or drink while performing experiments.
- Wash your hands thoroughly after completing each lab.

Protect Your Workspace

- Place a towel, tray, or protective covering on your table.
- Keep paper towels nearby for quick cleanup.
- Only use the chemicals and supplies included in your kit — never mix household products with lab materials unless the instructions specifically allow it.

Lab Assignments & Submission Policy

All lab work is completed independently at home using your lab kit and the recorded experiment videos.

Your Responsibilities

- Collect all required data, measurements, and observations as you work.
- Complete your own lab assignment and calculations — even if your experiment is similar to classmates'.
- Submit your lab as a single PDF to Blackboard by the posted due date.

Important Notes

- No late lab submissions are accepted.
- Missed labs receive a zero — no make-ups are allowed.
- Missing or incomplete data from an experiment cannot be replaced or guessed later.

Take your time, stay organized, and double-check your submission before uploading.

General Laboratory Safety Guidelines

Even outside a traditional lab, you are expected to follow proper safety procedures:

- Follow all instructions in the lab assignment and written procedure.
- Never perform any experiment that is not assigned.
- Read the entire procedure before starting.
- Clean spills immediately and dispose of materials as instructed.
- Keep children, pets, and distractions away from your workspace.

- Turn off any heat source (if used) before walking away.
- Wash hands and wipe down your workspace when finished.

Safety is not optional — it is part of being a responsible scientist.

Before You Begin: At-Home Lab Safety Checklist

Use this quick checklist before starting every experiment:

- ☐ Safety glasses on
- ☐ Clean, stable workspace
- ☐ Hair tied back
- ☐ No food or drinks nearby
- ☐ Lab kit materials ready
- ☐ Pre-lab video completed
- ☐ Lab instructions read fully
- ☐ Phone notifications silenced
- ☐ Paper towels / cleanup supplies ready

Final Reminder

Your at-home lab experience is designed to be safe, engaging, and meaningful — but it requires careful preparation, good habits, and respect for safety.

When you stay focused and follow these guidelines, you'll be able to enjoy hands-on chemistry learning from home while keeping yourself and your space safe.

Homework

Homework assignments are designed to **help you prepare for exams and strengthen your understanding** of the material.

- Homework will be completed on **Blackboard**.
- Each chapter will include assigned problems that reinforce lecture topics.
- Homework grades will be automatically recorded in the Blackboard gradebook.
- Staying consistent with homework is the best way to ensure success on exams.

Attendance & Participation Policy

Even though this course is fully online, attendance still matters. In an online class, attendance is measured by your weekly engagement in Blackboard, including logging in, completing assignments, reading announcements, and participating in course activities.

To help you stay on track:

Weekly Online Attendance Check

Attendance will be recorded every Wednesday.

To be counted “present” for the week, you must complete at least one meaningful login between:

Sunday 12:00 AM → Wednesday 11:59 PM

A meaningful login includes any of the following:

- Opening a module or lesson
- Completing or submitting an assignment
- Taking a quiz
- Posting to the discussion board
- Viewing a lecture video
- Accessing course materials for more than a brief moment

Simply clicking into Blackboard without engaging does not count as attendance.

Absence Limit

- You are allowed up to 4 “absence weeks” during the semester.
- If you accumulate 5 or more weeks without meeting the attendance requirement, you may be dropped from the course with an “F.”

Online classes require steady engagement — missing multiple weeks makes it extremely difficult to succeed.

Communication Is Key

If something comes up (illness, family emergency, work conflict), please contact me as soon as possible so we can determine how to keep you on track.

I can work with you — but only if you communicate early.

Withdrawing From the Course

If you choose to withdraw:

- You must officially withdraw through the Registrar’s Office by the posted drop date.
- If you stop participating without withdrawing, you may be administratively dropped with a grade of “F.”

Staying active and informed is essential for success in an online class.

Dropped Grades

To support your success, the following lowest grades will automatically be dropped at the end of the semester:

- **One lowest homework grade**
- **One lowest lab grade**
- **One lowest exam grade** (this may include the final exam)

Use these as safety nets — not as excuses to skip work. Staying consistent will make your final grade much stronger.

Grading Breakdown

Category	Percentage	Notes
Exams	50%	Four major exams + comprehensive final (lowest exam dropped)
Homework	20%	Lowest grade dropped
Laboratory	15%	Lowest grade dropped
Discussions/Journals	10%	Lowest grade dropped

Attendance	5%	
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Academic Integrity: Plagiarism & Cheating Policy

Honesty and integrity are at the heart of learning — especially in science. Every assignment, lab report, and exam is designed to help *you* grow as a student and thinker. Cutting corners not only hurts your grade, but also your own understanding of the material.

You are expected to complete your own work on all quizzes, exams, assignments, and projects.

Any form of plagiarism or cheating will result in:

- An automatic zero (0) for the assignment or exam involved.
- Further consequences, including a possible “F” in the course, if the situation warrants.

If a student is caught cheating on a Major Exam, they will receive a zero that cannot be replaced by the Final Exam option — that score will stand.

What Counts as Plagiarism

Plagiarism means using someone else’s words, data, or ideas as your own. This includes (but is not limited to):

1. Turning in a paper that was purchased, borrowed, or downloaded from another person or website.
2. Copying and pasting information from books, articles, or online sources without proper citation.
3. Using direct quotes (three or more words) without quotation marks and proper credit.
4. Missing in-text citations for ideas or data that are not your own.

When in doubt — cite it! If you’re unsure whether something needs a citation, ask me before submitting your work.

What Counts as Cheating

Cheating means gaining an unfair advantage on any form of academic work. Examples include:

1. Stealing or sharing exam content before it’s given.
2. Using unauthorized materials (notes, phones, apps, or the internet) during exams or quizzes.
3. Taking an exam for someone else or having someone take yours.
4. Copying another student’s answers on homework, quizzes, or exams.
5. Altering grades or submitting altered work for regrading.
6. Taking photos of tests, test answers, or another student’s paper.
7. Rewriting another student’s work during peer editing so that it’s no longer their original writing.

Bottom line: Academic integrity is about building trust — between you, your classmates, and me as your instructor. Mistakes can be forgiven, but dishonesty cannot. Protect your work, your integrity, and your learning.

Communication & Email Policy

Good communication helps everything run smoothly — especially in a course as fast-paced as Organic Chemistry! If you have a question, concern, or just need clarification, please don't hesitate to reach out.

How to Contact Me:

- **Email:** lalexander@southplainscollege.edu
- **Please do not use Blackboard messages.** They can easily get lost or overlooked. Always email through your **official SPC email account** for the fastest response.

Response Time:

- Emails received **Monday–Thursday (8:00 AM–3:45 PM)** will be answered within **48 hours**.
- Emails received after **3:45 PM on Thursday** or over a **weekend/holiday** will be answered within **48 hours of the next class day** after campus reopens.

Tip: If it's Friday evening, don't panic if you don't hear back right away — I'll respond as soon as the new week begins!

Email Etiquette & Online Conduct

Professional communication is part of your growth as a student — and as a future scientist or professional. When emailing or posting online (including Blackboard discussions or class group messages), please:

- Use a **respectful, courteous tone** — kindness goes a long way.
- Avoid profanity, sarcasm, or personal remarks.
- Keep messages clear and focused on the topic or question at hand.
- Sign your email with your **full name and course section** to help me respond quickly.
- If asking a question about a specific homework question please **include that question in the email**.

Our classroom — in person and online — should always be a space where everyone feels respected and able to learn. Disruptive or disrespectful behavior, in any form, will result in appropriate disciplinary action.

Remember: clear, polite communication helps me help you faster!

Technology Requirements

Because this course includes online components and digital assignments, it's important that you have access to reliable technology throughout the semester. Being prepared with the right tools will help you avoid unnecessary stress and stay successful in the course.

You will need:

1. **A reliable laptop or desktop computer** (not just a phone or tablet) with:
 - A stable **internet connection**
 - Adequate **storage space** for downloading and saving files
 - An updated **web browser** (Chrome recommended)
2. **A working webcam and microphone for Honorlock or other proctored exams.**

- You are responsible for making sure your device and webcam are working before testing days.
- We likely will not have proctored exams, but if it is needed please have the right equipment.
- 3. **The ability to create and submit PDFs.**
 - You'll need to know how to **take clear photos or scans of assignments and convert them to a single PDF file** before uploading to Blackboard.
 - Free scanning apps such as *Adobe Scan*, *Microsoft Lens*, or *CamScanner* work great for this purpose.
- 4. **Access to your SPC email and Blackboard** on your device.
 - Check both regularly for announcements, assignments, and important updates.

Tip: Technology issues happen — plan ahead and don't wait until the last minute to submit work or test your equipment.

If you experience ongoing technology difficulties, please contact the **SPC Help Desk** for assistance as soon as possible. Reliable technology is part of your responsibility in completing this course successfully.

Recommended Software & Apps

The following tools and programs will make your work in Organic Chemistry II smoother and more efficient. Most are **free or available through SPC resources**.

For Coursework & Organization

- **Microsoft Office (Word, Excel, PowerPoint)** – Available free through your SPC student account. Use Word for lab reports, Excel for data analysis, and PowerPoint for presentations.
- **OneDrive** – Great for saving backups of your work and sharing files securely.

For Chemistry-Specific Work

- **MolView (web-based, free)** – Helpful for drawing molecular structures and reaction mechanisms.
- **Organic Chemistry Model Kit App (or physical kit)** – Useful for visualizing stereochemistry and conformations.
 - **A physical kit** can be used during an exam, but an app may not be used.

For File Submissions

- **Adobe Scan, Microsoft Lens, or CamScanner** – Easy, free apps to scan handwritten work or lab reports into a single PDF file.
- **Adobe Acrobat Reader** – Lets you open, review, and combine PDF files for submission.

For Communication & Collaboration

- **SPC Email** – Check daily for announcements and communication from your instructor.
- **Blackboard App** – Handy for checking grades, assignment due dates, and course materials on the go (though you should still complete exams and uploads from a computer).

Tip: Download and test these tools early in the semester so you're confident using them before assignments and exams begin.

Responsible Use of Artificial Intelligence (AI)

Artificial intelligence (AI) tools such as ChatGPT, Copilot, Gemini, and similar technologies can be valuable study and learning tools when used responsibly. I encourage you to explore AI as a way to strengthen your understanding of chemistry. For example, you may use AI to:

- Ask for additional explanations of difficult concepts.
- Generate practice problems or study questions.
- Quiz yourself before an exam.
- Ask for help identifying gaps in your understanding.
- Explore different ways of approaching or thinking about a chemistry concept.
- Create study guides, flashcards, or review activities for your personal study.

However, AI may not be used to complete any assignment that is submitted for a grade unless I specifically state otherwise. This includes homework, lab assignments and reports, discussion posts, written responses, reflections, calculations, and other graded work.

Written work is especially important. Anything submitted in your name should reflect your own thinking, understanding, and voice—not text generated or rewritten by AI. Do not use AI to write an assignment and then edit or reword the response to make it appear to be your own. The purpose of written assignments is for you to process the material, make connections, and demonstrate what *you* understand.

A good rule to remember is:

Use AI to help you learn—not to do your learning for you.

If you use AI while studying, you are still responsible for verifying the information it provides. AI can confidently provide incorrect information, calculations, explanations, or references. Always compare information with your course materials, textbook, notes, and other reliable sources. If you are unsure whether a particular use of AI is appropriate, ask me before using it. I would much rather help you find a responsible way to use AI as a learning tool than have AI interfere with your opportunity to develop the skills this course is designed to teach.

INSTRUCTIONAL POLICIES AND RESPONSIBILITIES

For information regarding official South Plains College statements about intellectual exchange, disabilities, non-discrimination, Title IX Pregnancy Accommodations, CARE Team, and Campus Concealed Carry, please visit <https://www.southplainscollege.edu/syllabusstatements/>.

Week	Chapters	Labs
Week 1	Introduction Chapter 11: Solutions: Molarity, Molality, and Colligative Properties	Lab Safety
Week 2	Chapter 11: Solutions: Molarity, Molality, and Colligative Properties	Lab WS 1
Week 3	Chapter 12: Thermodynamics: Entropy and Gibbs Free Energy	Spectroscopy and Beer's Law
Week 4	Chapter 13: Chemical Equilibrium	Equilibrium and LeChatelier's Principle
Week 5	Exam 1	
Week 6	Chapter 14.1: Acid/Base Equilibria	Lab WS 3
Week 7	Chapter 14.2: Titrations Chapter 15: Solubility Product	Determination of Vitamin C Concentration by Redox Titration
Week 8	Exam 2	
Week 9	Chapter 16: Electrochemistry	pH of Common Materials
Week 10	Chapter 16: Electrochemistry	Electrochemistry
Week 11	Chapter 17: Kinetics and Reaction Rates	Lab WS 2 Reaction Rates
Week 12	Exam 3	
Week 13	Chapter 20: Nuclear Chemistry	Nuclear Decay
Week 14	Chapter 21: Introduction to Organic Chemistry	Naming Organic Compounds
Week 15	Exam 4	
FINALS	Final Exam	**Final is Comprehensive