



K-12
TEXAS TECH

Chemistry I – Semester B v8.0 – Syllabus

Course Name

CHEM1-B

CHEM1 v8.0 – Semester B

Course Information

In this course, students will study the foundations of chemistry, building on the concepts and scientific thinking developed in middle school science. Students use scientific inquiry and higher-order problem solving as they explore the composition, properties, and changes of matter and their applications through interactive simulations, engineering solutions, and virtual and hands-on experiences. The scientific process is fully used and documented in lab investigations, giving students the skills they need to analyze data and make inferences about natural phenomena. In addition, technology, engineering, and mathematics (STEM) concepts are integrated throughout the course. Through phenomenon-based learning, students will be able to demonstrate a vast understanding of the importance of chemistry in the world, enabling them to apply these principles to their everyday lives and our global society.

Course Delivery Method

Online

Contacting Your Instructor

You may contact your instructor using your Canvas Inbox. Technical support is available 24/7 at [TTU K-12](#).

Course Topics

After completing this course, the students should have increased knowledge of

- Understand the use of the mole as a significant unit of measurement in chemistry applications

- Determine mass, molar mass, and number of particles for elements and compounds
- Use balanced chemical equations to determine mole ratios for stoichiometric calculations
- Perform a variety of stoichiometric calculations, including percent yield and limiting reactants
- Differentiate between the different forms of energy and the interaction between thermal energy and matter
- Describe the properties and behavior of matter in relation to kinetic theory
- Read, interpret, and construct heating and cooling curves
- Learn about and apply various gas law relationships and the ideal gas law
- Distinguish between endothermic and exothermic reactions and processes
- Explore the concepts of enthalpy and potential energy diagrams for chemical reactions
- Differentiate between open, closed, and isolated systems
- Explore the various factors that affect the rate of chemical reactions and the concept of dynamic equilibrium
- Apply Le Châtelier's principle to predict the outcomes of stress on a reaction in equilibrium
- Understand how the various properties of water make it suitable for processes on Earth
- Perform molarity and dilution calculations
- Compare and contrast acids and bases and calculate the pH or pOH of a solution

Textbook and Materials

No textbooks required. All content is within Canvas.

- [desmos Scientific Calculator - Texas Version](#)
- STAAR Chemistry Reference Materials

Materials

Optional

- 05.06 Limiting Reactant
 - two boxes/packages of the same cookie mix, measuring cups and spoons, mixing spoons and bowls, two baking pans of the same size and depth, additional ingredients requested by cookie mix recipe
- 05.07 Percent Yield
 - heat source (a stove or hot plate will work best), baking soda, kitchen scale, stirring spoon, cooking pot

- 06.02 Kinetic Molecular Theory
 - friend or family member, scented candle, matches or lighter, spray air freshener, stopwatch or timer
- 06.03 Phase Changes
 - household or crafting items
- 06.04 Gas Laws
 - **Activity 1:** 3-inch x 5-inch card, marker, pencil
 - **Activity 2:** one empty soda can, tongs, water, one two- to three-quart saucepan
- 07.01 Endothermic and Exothermic
 - bowl of cold water, second bowl of very warm (but still safe to the touch) water, third bowl of room-temperature water
- 08.01 Properties of Water
 - toothpick, cup, water, small bowl, soap, staple or paperclip
- 08.04 Acids and Bases
 - red cabbage
 - rubbing alcohol
 - cheesecloth
 - paper towels
 - 10 clear plastic cups
 - labelling pen or marker
 - two small bowls
 - tablespoon
 - three tablespoons of:
 - distilled water
 - lemon juice
 - cola
 - corn oil
 - shampoo
 - vinegar
 - dishwashing liquid

Technical Requirements

- Internet access – preferably high speed (for accessing Canvas)
 - browser (we recommend Chrome)
 - supported browser plugins and settings
- The following plugins and settings may be required to use our courses.

- JavaScript enabled
 - Cookies enabled
 - Java installed
- Email
- Printing capabilities
- Adobe Reader (download from [Adobe](#))
- Audio and video capabilities (for watching/listening to course content)
- PDF app (free options available)

Technical Skill Requirements

Be comfortable with the following:

- accessing online learning materials via Canvas
- Internet search engines and browsers (we recommend Chrome)
- uploading assignments into Canvas (there will be instructions for uploading assignments)

Course Pacing

This course is designed to be completed in 18 weeks.

- Print this guide and use a calendar to fill in your goal dates for completing each Module.
- Note that you must have a grade of 70 or above on a Discussion-Based Assessment (DBA) in order to continue moving forward in the course. DBAs occur every other lesson.
- To achieve success, students are expected to submit work in each course weekly.
- Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week.
- Post the pace guide in a place where you and your Parent or Guardian will see it every day (on the refrigerator or next to the computer). Give yourself a check every time you complete a task, and celebrate your efforts!

****You will see that this lesson is labeled as “Honors,” but you must complete it in order to meet Texas standards. It is not optional for this course.**

Weeks	Lessons	Due Date (you write this in)
1	Checkpoint 1 05.00 Stoichiometry Introduction 05.01 Using the Mole 05.02 Molar Mass of Compounds **05.03 Honors Compound Formulas	
2	05.04 Stoichiometry I 05.05 Stoichiometry II	
3	05.06 Limiting Reactant 05.07 Percent Yield	
4	05.08 Stoichiometry Discussion-Based Assessment *05.09 Stoichiometry Exam	
5	06.00 Phases of Matter Introduction 06.01 Energy 06.02 Kinetic Molecular Theory	
6	06.03 Phase Changes 06.04 Gas Laws	
7	06.05 Gas Laws Lab **06.06 Honors Ideal Gas Behavior	
8	*06.08 Phases of Matter Exam 07.00 Energy in Reactions Introduction	
9	07.01 Endothermic and Exothermic 07.015 The Laws of Thermodynamics 07.02 Enthalpy Values	
10	07.04 Reaction Rates 07.05 Equilibrium	
11	07.07 Energy in Reactions Discussion-Based Assessment	
12	*07.08 Energy in Reactions Exam 08.00 Solutions Introduction	

Weeks	Lessons	Due Date (you write this in)
13	08.01 Properties of Water 08.015 The Behavior of Solutions 08.02 Molarity and Dilutions	
14	08.03 Solutions Lab 08.04 Acids and Bases	
15	08.05 Acid and Base Calculations *08.08 Solutions Exam	
16	*Final Exam	
17	Floating Vacation Week	
18	Floating Vacation Week	

Course Credit

Your grade will be calculated as follows:

- formative assessments (50%)
- summative assessments (20%)
- summative final exam (30%)

Assignments are labeled as “summative” or “formative” under Grades in Canvas.

Course Completion and Extensions

- Students may not complete the course in less than 30 days.
- All courses expire 180 days after the enrollment date.

Academic Integrity

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Artificial Intelligence (AI) Use Policy

This policy covers any generative AI tool, such as ChatGTP, Elicit, Photo Math, etc. This includes text and artwork/graphics/video/audio, etc.

All work submitted in this course must be your own. You may not use artificial intelligence tools to complete your assignments in this course.

If an instructor suspects that an assignment is not the work of the student, it will receive a score of zero. The instructor will message the student or provide feedback on the assignment indicating the need to schedule a one-on-one video conference, during which the student will be required to demonstrate their skills or knowledge through an alternative or mutually agreed-upon assignment. The grade of the alternate or agreed upon assignment will be determined at the instructor's discretion with the highest possible score being 70%.

If it is determined that a student has violated final exam directions on Final Exam A or CBE Set 1, the exam will be scored as zero. The student may take Final Exam B or CBE Set 2 with the highest possible score being 70%.

The incident will be reported to Texas Tech K-12 Administration and documented in the student's file. Continued violations of Texas Tech University's Academic Integrity Policy will result in the removal of the student from the program.

Student/Parent Expectations

You will be expected to log into the Canvas course regularly to be aware of possible announcements/reminders and to pace your student's progress in the course.

The following are prohibited while using the Canvas interface:

- spamming;
- hacking; and
- using TTU or Canvas email for commercial purposes;

Inappropriate behavior shall result in consequences ranging from a request to correct the problem, to removal from the course or even the university, depending on the severity of the behavior. Disciplinary actions will be taken according to the TTU K-12 Student Handbook.

Communication

- You can expect a reply from your instructor within 2 business days.
- Use the Canvas Inbox for sending messages to your instructor.

Submitting Assignments

You will submit all assignments through Canvas, rather than by mail or email.

Technical Difficulties

Getting Help

For student assistance with Canvas, visit [TTU K-12 Support](#).

Computer Problems

A working computer is necessary for online coursework. Computer problems will not be accepted as a valid reason for failure to complete course activities within the allotted time frame. Identify a second computer, before the course begins, that you can use if you experience computer problems.

Server Problems

When the Canvas server needs to be taken down for maintenance, the Canvas administrator will post an announcement in your course informing you of the time and date. If the server experiences unforeseen problems, your course instructor will notify you.

Lost or Corrupted Files

You must keep/save a copy of every project/assignment on an external disk or personal computer. In the event of any kind of technology failure (e.g., Canvas server crash or virus infection, students' own computer problems, loss of files in cyberspace, etc.) or any disputes, the instructor may request or require you to resubmit the files. In some instances, the instructor may need to open another attempt within Canvas, so communication with your instructor is critical in these circumstances.