



K-12
TEXAS TECH

Chemistry I – Semester A v8.0 – Syllabus

Course Name

CHEM1-A

CHEM1 v8.0 – Semester A

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

- Learn about the mathematical skills and measurement systems used in chemistry

- Interpret scientific data and explain relationships between variables based on data
- Follow the scientific method to conduct various laboratory investigations
- Explore the differences between all states of matter and the classification of matter
- Differentiate between physical and chemical properties and changes in matter
- Explore the development of the scientific model of atoms from investigations of the past
- Use the model of the atom to understand subatomic particles and reading the periodic table
- Read the periodic table and determine the general properties of elements, groups, and families
- Utilize the periodic table as a fundamental tool for a variety of chemistry problems and applications
- Write electron configurations and draw orbital notation models for atoms
- Determine valence electrons and bonding properties of atoms
- Read, write, interpret, and model chemical formulas for ionic and covalent bond
- Compare the different intermolecular forces in compounds and model molecule structures
- Apply the law of conservation of mass to balance chemical equations
- Classify synthesis, decomposition, combustion, single and double replacement, and redox chemical reactions
- Compare the fundamental forces and chemical and nuclear reactions

Textbook and Materials

No textbooks required. All content is within Canvas.

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

Materials

Optional

- 01.05 Changes in Matter
 - ice cubes (at least one cupful), one two- to three-quart saucepan, a kitchen thermometer (that measures temperatures up to at least 105 °C, or around 215 °F), a stove top
- 01.06 Pure Substances and Mixtures
 - candy with a colored coating, like Skittles® or M&Ms® (four different colors), rubbing alcohol or isopropyl alcohol, coffee filters (two), tall glasses or plastic cups (two), pencil, ruler, tape, foil or paper plate, table

salt, water, toothpicks or cotton swabs (four), measuring cups or spoons, clean pitcher or two-liter bottle

- 01.07 Properties of Matter Lab
 - apple juice, orange juice, or milk; any type of vinegar, cooking wine, saltwater, thermometer, pots, heat source
- 02.02 Periodic Table
 - empty container, 100 random pennies, kitchen scale
- 03.04 Covalent Bonding
 - multicolored gumdrops, marshmallows, soft candy, fruit, aluminum foil balled up, foam balls, cotton balls, play dough, or cereal; Q-tips, hair pins, toothpicks, paperclips, or other stick-like objects; paper and pencil
- 04.02 Synthesis and Decomposition Reactions
 - assorted colors of building blocks (such as Legos®)
- 04.04 Redox Reactions
 - **Activity 1:** 20 dull pennies, 1/4 cup white vinegar (dilute acetic acid), one teaspoon table salt (NaCl), 1 shallow, clear glass or plastic bowl (not metal), one plastic spoon or fork, one or two clean steel screws or nails (not galvanized) or plain metal paper clips, water, measuring spoons, paper towels
 - **Activity 2:** lemon, strip of copper metal (a penny will work as well), strip of zinc metal (a nickel will work as well), two cables with alligator clips, knife (used with permission from a guardian), a clock or other device with an LCD display
- 04.06 Honors Radioactive Decay
 - 200 M&M® candies, pennies, or other small candies/items with two distinct sides, shoebox or another small box with a lid

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 01.00 Matter Introduction 01.01 Science of Chemistry 01.02 Measuring Matter	
2	01.04 Properties of Matter 01.05 Changes in Matter	
3	01.06 Pure Substances and Mixtures 01.07 Properties of Matter Lab	
4	01.08 Matter Discussion-Based Assessment *01.09 Matter Exam	
5	02.00 Atoms and Elements Introduction 02.01 Atomic Theory 02.01B Contributions to Chemistry 02.02 Periodic Table	
6	02.03 Atomic Models 02.04 Electromagnetic Radiation	
7	02.05 Atomic Energy	
8	Checkpoint 2 *02.08 Atoms and Elements Exam	
9	03.00 Molecules and Compounds Introduction 03.01 Valence Electrons 03.02 Nomenclature	
10	03.03 Ionic Bonding 03.04 Covalent Bonding	
11	03.05 Molecular Structure 03.06 Forces and Bonds	
12	03.08 Molecules and Compounds Discussion-Based Assessment *03.09 Molecules and Compounds Exam	
13	04.00 Reactions Introduction 04.01 Conservation of Mass 04.02 Synthesis and Decomposition Reactions	
14	04.03 Single and Double Replacement Reactions 04.04 Redox Reactions	

Weeks	Lessons	Due Date (you write this in)
15	04.05 Reactions in Our World **04.06 Honors Radioactive Decay Checkpoint 3	
16	*04.08 Reactions Exam * 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.