Sul Ross State University
Syllabus for General Chemistry I:
CHEM 1311 1V1- 31246 (Summer I, 2026)

Class: General Chemistry I
Room: Only Web-based Blackboard
Time: M, T, W, Th, F
10:00 AM to 11:40 AM
Date: May 27 to July 1, 2026

Instructor: Dr. Hong Young Chang
Office Hours: M-R 3:00-5:00 pm via Zoom
Email: hong.young.chang@sulross.edu

OBJECTIVES

Student Learning Objectives (SLO):
A student graduating with a ***chemistry major*** is expected to demonstrate that he can do the following:

1. Organic Chemistry—Students will be able to draw organic molecular structures and explain organic reactions, stereochemistry, structural analysis and reactions in biological systems.

2. Inorganic Chemistry—The student will be able to demonstrate understanding of coordination chemistry, valence theory, elementary actions and advanced molecular theory.

3. Analytical Chemistry—The student will be able to demonstrate an understanding of theory of analytical chemistry and conduct analytical analysis, including data analysis and calibration, equilibrium chemistry, gravimetric analysis, titrimetric analysis, spectroscopic analysis, and electrochemical analysis.

4. Physical Chemistry—The student will be able to demonstrate an understanding of the application and theory of physical chemistry, including topics such as atomic structure, electrochemistry, surface chemistry, solid-state chemistry, and thermodynamics.

5. Research—The student will collect and analyze published chemical literature and undertake a chemistry research project.

General Chemistry I Learning Objectives:
At the end of this course, a student should have a good understanding of:
1. The basic concepts and terms used in chemistry
2. The electronic structures of atoms and the periodic table
3. The basic concepts of chemical bonding
4. Chemical reactions in aqueous solutions
5. The ideal gas equation

Core Objectives (CO):

1. **Critical Thinking Skills** – Students will gain/improve their critical thinking ability by solving real-life chemistry problems through inquiry, analysis, and evaluation of available information. Students will be tested on their critical thinking ability in exams and through lab experiments.

2. **Communication Skills** – Students will have the opportunity to improve communication skills through oral discussion and writing reports (i.e., observation, explanation, and conclusion, etc.) on the experiments done in the lab sessions.

3. **Empirical and Quantitative Skills** – Students will use the mathematical skills needed to manipulate and analyze numerical data obtained through experimentation to form conclusions.

4. **Teamwork** – Students will use team spirit and consider different points of view to work effectively while conducting experiments as a team, working toward a shared purpose or goal.

Textbook: "***General Chemistry: The Essential Concepts 14th Edition***" by Raymond Chang and Kenneth A. Goldsby, McGraw-Hill, New York, United States of America, **2014**. (Older editions, such as the 7th, are 6th editions are ok to use.

Calculator: A scientific calculator is required for this course.

Web Availability: This lecture is done ***via an online class using "Blackboard" of SRSU.*** There is no face-to-face attendance. Therefore, students have to set up their Blackboard account to see the lecture video file. ***The lecture video files will be uploaded to the Blackboard.*** Students can see these files after class

The following chapters will be covered in General Chemistry I:

Chapter 1: Basic Concepts: Classification of Matter; Physical and Chemical Properties of Matter

Chapter 2: Atoms, Molecules, and Ions

Chapter 3: Stoichiometry

Chapter 4: Reactions in Aqueous Solutions

Chapter 5: The Ideal Gas Equation

Chapter 7: The Electronic Structure of Atoms

Chapter 8: The Periodic Table

Chapter 9 and 10: Chemical Bonding

Homework & Assignments: There will be problem sets assigned for each chapter. In only this class. ***Homework is to solve the given problem sets.*** ***Students who take this class solve the problem sets on the Blackboard. Multi-attempts will be made to solve the problem sets. The best score of your multiple attempts will be recorded as your final score for homework & assignment. Since all homework for each chapter has its due date, students must finish their homework on the blackboard by keeping its due date.***

Announcements: Students have to keep the announcements from the professor. Because the face-to-face approach is not possible, ***students have to check their email all the time, and they have to access their Blackboard accounts frequently.***

Examinations: There will be ***three midterm*** examinations and ***a final*** examination. The final is mandatory and comprehensive. ***All examinations are done on the Blackboard of SRSU. In the limited time, the problem sets of all examinations will be seen on the blackboard. Multiple attempts are not allowed for all examinations.*** **NO MAKE-UP EXAMS WILL BE GIVEN.**

NOTE: Homework and Exams MUST be completed on the blackboard of SRSU!

ATTENDANCE: on the Blackboard, the attendance of students and the access to the Blackboard would be checked. ***There is no face-to-face attendance.***

PERCENTAGE BREAKDOWN OF MARKS:

Homework & Assignment: 40% (each chapter has 30-35 problem sets)
Midterm Exams (13.3% each): 40%
Final Exam: 20%

Midterm Exam I: Thursday, June 4th (covers Ch1 & Ch2)
(1hr, by CDT: 12:30 pm to 10:00 pm)
Midterm Exam II: Tuesday, June 16th (covers Ch3 & Ch4)
(1hr, by CDT: 12:30 pm to 10:00 pm)
Midterm Exam III: Wednesday, June 24th (covers Ch5, Ch7 & Ch8)
(1hr, by CDT: 12:30 pm to 10:00 pm)
Final Exam: Tuesday, June 30th (covers all chapters, but Ch3, Ch4, Ch9 & Ch10 mainly occupy) (2 hours, by CDT: 12:30 pm to 10:00 pm)

All Exams will be posted on the Blackboard. (Based on CDT, from 12:30 pm to 10:00 pm)
You can choose your convenient time. All Exams will be done during non-class time.

Students with Special Needs:

Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students

with documented disabilities. It is the student's responsibility to initiate a request for accessibility service. Please contact Ms. Rebecca Greathouse Wren, M.Ed., LPC-S, Director/Counselor, Accessibility Services Coordinator, Ferguson Hall (Suite 112) at 432.837.8203; mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. E-mail: rebecca.wren@sulross.edu Students should then contact the instructor as soon as possible to initiate the recommended accommodations.

Academic Integrity:

Academic dishonesty hurts everyone and reduces the value of college degrees. Doing someone else's work, presenting the ideas and work of others as your own, submitting the same paper for multiple classes, and/or failing to cite your sources when you utilize the ideas of others, are all examples of academic dishonesty. It is your responsibility to read and understand the university's policy on academic dishonesty in the SRSU Student Handbook, as all violations will be taken seriously and handled through the appropriate university process. The Student Handbook can be found at: https://www.sulross.edu/catalog/undergraduate-academic-regulations-2/#1605412215143-c8b265dc-3e01
In addition, please note that plagiarism detection software will be used in this class for written assignments.

Libraries:

The Bryan Wildenthal Memorial Library in Alpine offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu/. Off-campus access requires logging in with your LobolD and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123).
No matter where you are based, public libraries and many academic and special libraries welcome the public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting library.sulross.edu/find-and-borrow/texshare/ or ask by emailing srsulibrary@sulross.edu.
News for Fall 2024: Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as Interlibrary Loan (ILL) and Scant to get materials delivered to you at home or via email.

Counselling: *Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counselling sessions. You can learn more about this 24/7/356 support by visiting Timelycare/SRSU. The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and RGC students.*

Classroom Climate of Respect: *Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose, and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still, we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.*

Distance Education: *Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires a secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing student complaint are located in the student handbook.*

Course Calendar: The following pages include the course calendar. You need to focus on date, lecture number, chapter number, topics, homework due day, and examination days. This course calendar could be changed.

Date	Lecture #	Chapter #	Topic	Due work	Exam day
27-May	Lecture 1	Ch1	Discussion on Syllabus; Importance of chemistry; classifications of matter, overview of states and properties of matter, physical and chemical changes, units of measurements (length, volume, density, temperature etc.)		
28-May	Lecture 2		Significant figures and scientific notation Precision & accuracy and measurement uncertainty		
29-May	Lecture 3	Ch2	Dalton's atomic theory, discoveries of subatomic particles (electron, proton, and neutron), Rutherford's atomic model, atomic number, mass number, and isotopes	Due HW of Ch1	
1-Jun	Lecture 4		Molecules, compounds, ionic formula with Cross-Over Rule, molecular formula and empirical formulas		
2-Jun	Lecture 5		Common inorganic cations and anions Chemical nomenclature, naming of compounds, acids, bases, oxides, oxoacids, hydrates		
3-Jun	Lecture 6	Ch3	Molecular mass, mole, molar mass, atomic mass, and formula mass, mole concept	Due HW of Ch2	
4-Jun	Lecture 7		Mole concept again		**Exam I**

5-Jun	Lecture 8		Chemical equations and balancing chemical equations, calculations of product/reactant amounts using balanced chemical equations,		
8-Jun	Lecture 9		limiting reagents, and percent yields		
9-Jun	Lecture 10	Ch4	Classification of chemical reactions, Terminologies related to solute, solvent, solutions, electrolytes, nonelectrolytes, ionization, and hydration. Precipitation reactions, solubility, writing balanced ionic equations & net ionic equations	Due HW of Ch3	
10-Jun	Lecture 11		Acid-base concepts, hydronium ions (hydrated proton), Mono-/di-protic acids Acid-base reactions and neutralization reactions		
11-Jun	Lecture 12		Reduction-oxidation reactions and oxidation numbers Regular oxidation numbers in the periodic table.		
12-Jun	Lecture 13		oxidation-reduction reactions- types with examples Solution chemistry, solution stoichiometry, molarity, preparation of solutions, dilution, gravimetric analysis, and titration		
15-Jun	Lecture 14	Ch5	Physical properties of gas and pressure unit Ideal gas law and its applications, gas stoichiometry- calculation of reactant/product amounts in gaseous reactions using the ideal gas equation	Due HW of Ch4	

16-Jun	Lecture 15		Kinetic theory of ideal gases, deviation of deal gas, properties, modification of ideal gas law for real gases,		**Exam II**
17-Jun	Lecture 16	Ch7	Properties of waves, electromagnetic radiations Atomic spectra and Bohr atomic theory, De Broglie equation, dual nature of particles, Schrodinger wave, equation, and orbital concept, electronic configuration, Aufbau principle, Hund's rule, para magnetism	Due HW of Ch5	
18-Jun	Lecture 17		4 kinds of quantum numbers and electron configuration		
19-Jun	Lecture 18	Ch8	Introductory discussion on the periodic table, classification of elements, Effective nuclear charge and screening effect Atomic sizes and radius Isoelectronic structures	Due HW of Ch7	
22-Jun	Lecture 19		Ionization energy (E), Electron affinity, Metal, metalloids, non-metal, halogen groups Periodic variation of properties of elements; group properties of elements		
23-Jun	Lecture 20	Ch9	Valence electrons, Lewis's dot structures, Octet rules, ionic bonds, lattice energy (U), covalent bonds, covalent bond lengths, double bond, and triple bond Polar covalent bonds and electronegativity	Due HW of Ch8	

24-Jun	Lecture 21		Drawing Lewis structures, formal charges, resonance structures, and exception of octet rules		**Exam III**
25-Jun	Lecture 22	Ch10	Valence shell electron pair repulsion (VSEPR) model Predication of molecular geometry Dipole moment and polar bonding Valence bond theory, hybridization (*sp*, sp^2, sp^3, etc.), sigma(σ) bond and pi(π) bond,	Due HW of Ch9	
26-Jun	Lecture 23		Molecular orbital theory and molecular orbital(MO) configurations	Due HW of Ch10	
30-Jun	Lecture 24		Final Exam day (via Blackboard), 2hrs		**Final Exam**