SUL ROSS STATE UNIVERSITY
Syllabus for General Chemistry II-(CRN:21621)
CHEM 1312_001
Spring 2026

General Chemistry II: Lecture (3 credits)
Room: WSB 307
Time: T/Th: 9:30-10:45 am
Date: 1/14/2026 to 5/6/2026

Instructor: Dr. Hong Young Chang
Office: WSB 219
Email: hxc19tv@sulross.edu
Office Hours: M-Th 2:00-6:30pm
(with appointment)

OBJECTIVES

Student Learning Objectives (SLO):

A student graduating with the ***chemistry major*** is expected to demonstrate that (s)he is able to 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.

BSc in Chemistry Marketable Skills

1. Students will become good at punctuality and time management.
2. Students will analyze &/or synthesize molecules and perform spectroscopic characterization and interpret their results scientifically.
3. Students will become proficient at writing scientific papers and identifying appropriate references for their papers.
4. Students will become proficient at orally presenting scientific topics including the use of visual aids.

General Chemistry II Learning Objectives:

At the end of this course, a student should have a good understanding of:

1. The basic concepts of intermolecular forces

2. Physical properties of solutions

3. The basic concepts of chemical kinetics and equilibrium

4. The concepts of acid and bases

5. Chemical equilibrium in acid-base reactions

6. Laws of thermodynamics: Gibbs free energy and reaction spontaneity

7. Redox reactions

8. Organic molecules and hydrocarbons

The following chapters will be covered in General Chemistry II:

Chapter 6: Energy Relationships in Chemical Reactions

Chapter 24: Introduction to Organic Chemistry

Chapter 11: Intermolecular Forces and Liquids and Solids

Chapter 12: Physical Properties of Solutions

Chapter 13: Chemical Kinetics

Chapter 14: Chemical Equilibrium

Chapter 15: Acids and Bases

Chapter 16: Acid-Base Equilibria and Solubility Equilibria

Chapter 17: Entropy, Free Energy, and Equilibrium

Chapter 18: Redox Reactions & Electrochemistry

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 of improving 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 in order 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, **2023**. (Older editions such as the 6th are 7th editions are ok to use).

The SRSU library has one copy of the textbook of General Chemistry in the "Textbook Collection" section. Please ask the library front desk if you need help finding this textbook.

Suggested Reading and References:

1. "***OpenStax Chemistry 2e***" https://openstax.org/details/books/chemistry-2e by Paul Flowers, Klaus Theopold, Richard Langley, etc.

2. "***Chemistry LibreTexts***" (Beginning Chemistry (Ball), Introductory, Conceptual, and GOB Chemistry - Chemistry LibreTexts

Web Availability: This course will be taught face-to-face. However, you need to do your homework ***by "Blackboard" of SRSU.*** In addition, homework & assignments, and announcements, will be uploaded on the blackboard or by email.

Calculator: A scientific calculator is required for this course.

Cell phones, including **Earphones and Headsets,** ARE **NOT** permitted for use in exams and should be turned off during class time.

Homework & Assignments: There are two kinds of homework assignments for each chapter. ***One homework will be solved in the SRSU Blackboard (multiple choice homework). You may try to solve the problem sets several times to attain the highest score. You need to keep their due day for each chapter. Their due day for each chapter will be notified.***

The other homework will be done with your pen. This homework style is short answer problem sets. After downloading and printing the homework sheet, you need to solve the problem sets. After solving the problem sets, you need to scan the sheet with your cellphone or scanner (your cellphone has this scanner function after downloading the corresponding application files. Please, turn in your homework as one PDF file). You also need to keep their due day for each chapter. **NO LATE HOMEWORK WILL BE ACCEPTED.** You may turn in this homework via in-person. Your professor will review and check this submitted homework to know whether you copy other students' homework or not.

Examinations: There will be ***three midterm*** examinations and ***a final*** examination. The final is mandatory and comprehensive. *The final exam will be taken in the face to face style.*

NO MAKE-UP EXAMS WILL BE GIVEN.

NOTE: all exams MUST be completed in pen with the face-to-face style!

ATTENDANCE PRERESQUITE: BEING ABSENT FROM MORE THAN 9 LECTURES WILL RESULT IN FAILING THE COURSE.

PERCENTAGE BREAKDOWN OF MARKS:

Homework & Assignments: 20%

(multiple-choice 10 % and short-answer 10 %. If there is no short-answer homework, the multiple-choice homework will occupy 20%.)

Each Midterm Exam (20 %): 60%

Final Exam: 20%

Midterm Exam I: Tuesday, February 10th as face-to-face

Midterm Exam II: Tuesday, March 24th as face-to-face

Midterm Exam III: Tuesday, April 21st *via* Blackboard

Final Exam: Monday, May 4th 8:00 AM–10:00 AM, face-to-face in WSB 307

CHEM1302 Course Calendar

* This course calendar could be changed. Before one week, your professor will let you know the changes.

Date	Lecture #	Chapter #	Topics	Due work
Jan.15	Lecture 1	Ch 6	Discussion on Syllabus. Importance of chemical energy, types of energy, energy changes in chemical reactions	
Jan.20	Lecture 2		The first law of thermodynamics, enthalpy of chemical reactions, and calorimetry.	
Jan.22	Lecture 3		Hess's law and standard enthalpy of formation & reaction. Discussion on selective questions and problems on Chapter 6	
Jan.27	Lecture 4	Ch 24	Classification of organic compounds and aliphatic/aromatic hydrocarbons and nomenclature on hydrocarbons and their structures on Chapter 24.	**Ch6 HW due**
Jan.29	Lecture 5		Discussion on selective questions and problems in Chapter 24. Chemistry of the functional groups and Chirality-hardness of molecules, Types of intermolecular forces, properties of liquids, liquid-vapor equilibrium, liquid-solid equilibrium, and solid-vapor equilibrium.	
Feb.3	Lecture 6	Ch 11	Liquid-solid equilibrium, phase change & phase diagrams	**Ch24 HW due**
Feb.5	Lecture 7		Discussion on selective questions and problems on Chapter 11. **Exam I revision**	
Feb.10	Lecture 8	Test	**Exam I Day (It covers Ch6, Ch24, & Ch11)**	**Ch11 HW due**
Feb.17	Lecture 9	Ch 12	Factors affecting solubility, Types of solutions,	
Feb.19	Lecture 10		Concentration units & Colligative properties	
Feb.24	Lecture 11	Ch 13	Discussion on selective questions and problems on Chapter 12. Understanding of terminologies related to rate laws. Zero, first & second-order reactions	

Feb.26	Lecture 12		Experimental rate laws, activation energy and temperature dependence of rate constant on Chapter13	**Ch12 HW due**
Mar.3	Lecture 13		Elementary reactions, reaction mechanisms, and catalysis. Experimental determination of rate laws. Discussion on selective questions and problems on Chapter 13	
Mar.5	Lecture 14	Ch 14	Understanding the concepts of chemical equilibrium, equilibrium constants, reaction quotients, calculation of equilibrium concentrations, and factors affecting chemical equilibrium.	
Mar.17	Lecture 15		Discussion on selective questions and problems on chapter 14	**Ch13 HW due**
Mar.19	Lecture 16	Review & Test	**Exam II revision**	
Mar.24	Lecture 17		**Exam II (It covers Ch12, Ch13, & Ch14)**	**Ch14 HW due**
Mar.26	Lecture 18	Ch 15 & Ch 16	Understanding concepts of acids and bases, acid-base properties of water, pH, strength of acids and bases, ionization constants of weak and bases, and percent ionization.	
Mar.31	Lecture 19		Ionization constants of conjugate acids-bases, determination of pH for weak acids and bases using ICE tables, acid-base properties of salts, Lewis's acids and bases. Discussion on selective questions and problems in Chapter 15.	**Ch15 HW due**
Apr.2	Lecture 20		Common ion effect in chemical equilibrium, Henderson-Hasselbalch equation. Strong acid-strong base titrations, weak acid-strong base titrations, acid-base indicators	
Apr.7	Lecture 21	Ch 16 & Ch 17	Solubility product, molar solubility, predicting precipitation reactions, common ion effect and pH on solubility	
Apr.9	Lecture 22		Discussion on selective questions and problems in Chapter 16. Spontaneous processes and entropy, and microstates related to entropy on Chapter 17.	
Apr.14	Lecture 23		The second law of thermodynamics, entropy changes in systems and surroundings, and the third law of thermodynamics on Chapter 17.	**Ch17 HW due**

Apr.16	Lecture 24	Ch 17 & Ch 18, Exam III	Gibbs free energy chemical equilibrium, and discussion on selective questions and problems on Chapter 17.	
Apr.21	Lecture 25		**Exam III revision. Exam III (It covers Ch15, Ch16, & Ch17. Students take this Exam III via *Blackboard*, not class time)** Redox reactions, balancing redox equations, spontaneous Galvanic cells, and standard reduction	
Apr.23	Lecture 26	Ch 18 & Review	Discussion on selective questions and problems in Chapter 18.	
Apr.28	Lecture 27		**Revision on final exam.**	**Ch18 HW due**
May.4	Lecture 28	Final Exam	**5/4, Monday, 8:00 AM to 10:00 AM, WSB307**	

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 general 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 a librarian by emailing srsulibrary@sulross.edu.

New for Spring 2026: Mike Fernandez, SRSU Librarian, offers 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.

Academic Integrity: Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. Students should submit work that is their own and avoid the temptation to engage in behaviors that violate academic integrity, such as turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources ***unless permission is expressly given*** for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

Counselling: Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling 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 an 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 on 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 complaints are located in the student handbook.

SRSU Disability Services: ADA (Americans with Disabilities Act): *Sul Ross State University (SRSU) is committed to equal access in compliance with 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.*

Scholastic Dishonesty: *Students who violate the University rules on scholastic dishonesty are subject to penalties, including the possibility of an **F** in the course and/or dismissal from the University.* ***All assignments (including homework) need to be individually completed and not copied from another student's work.***