Sul Ross State University
Syllabus for Organic Chemistry I: CHEM 2423 001 (Fall 2025) (CRN: 12523)

Class: Organic Chemistry I
Room: WSB 307
Time: MWF 9:00-9:50 am

Instructor: Dr. Hong Young Chang
Office: WSB 219
Email: hong.young.chang@sulross.edu
Office Phone: (432) 837-8113
Office Hour: M-R 2:00-4:30 pm

OBJECTIVES:

Student Learning Outcomes (SLO):

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

BSc in Chemistry Marketable Skills

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

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.

Organic Chemistry I Learning Objectives:

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

1. The language of aliphatic-based organic chemistry
2. The major functional groups in organic compounds
3. Retrosynthetic analysis to design simple and complex organic molecules
4. Applications of thermodynamic and kinetic principles to predict regiochemical and stereochemical outcomes of organic reactions
5. Infrared (IR), nuclear magnetic resonance (NMR), and mass spectroscopy (MS)

REQUIRED RESOURCES AND TEXTS:

TEXT BOOK:
"Organic Chemistry" by T. W. Solomons, C. B. Fryle and S.A. Snyder (11th ed.), **2014**, John Wiley & Sons

The SRSU library has one copy of this textbook in the "Textbook Collection" section. Please ask the library front desk if you need help finding this textbook.
Suggested reading: "Survival guide to organic chemistry: bridging the gap from general chemistry" by Patrick E. McMahon, Bohdan B. Khomtchouk, and Claes Wahlestedt, **2017**, CRC Press, Taylor & Francis Group.

SRSU Library Services: The Sul Ross Library 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 your LoboID and password. Check out materials using your photo ID. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).

Electronic Tool to Draw Chemical Structures:
ACD/ChemSketch is a computer program that you can use to draw organic structures, organic reactions, etc. You can download ACD/ChemSketch) onto your own personal computer (PC or Mac): ChemSketch Download for Academic and Personal Use | ACD/Labs (acdlabs.com)

Make sure you follow the requirements for the password and use your SRSU email address to register.

The following chapters will be covered:

Chapter 1: The Basics: Bonding and Molecular Structure

Chapter 2: Families of Carbon Compounds: Functional Groups and Intermolecular Forces

Chapter 3: Acids and Bases: Introduction to Organic Reactions and Their Mechanisms

Chapter 4: Nomenclature and Conformations of Alkanes and Cycloalkanes

Chapter 5: Stereochemistry: Chiral Molecules Determination

Chapter 6: Ionic Reactions: Nucleophilic Substitution and Elimination Reactions of Alkyl Halides

Chapter 7: Alkenes and Alkynes I: Properties & Synthesis

Chapter 8: Alkenes and Alkynes II Addition Reactions

Chapter 2.15: Infrared Spectroscopy & Chapter 9: **Nuclear Magnetic Resonance (NMR) and Mass Spectrometry (MS):** Tools for Structure

Chapter 10: Radical Reactions

HOMEWORK:

All homework will be assigned for each chapter, and it will be uploaded to Blackboard.
The homework must be completed in pen.
NO LATE HOMEWORK WILL BE ACCEPTED.
Homework must be submitted on paper using the given PDF uploaded on Blackboard.
It is not accepted by email.

NOTE: Homework and Exams MUST be completed by hand!

EXAMINATIONS:

There will be ***three midterm*** examinations and ***a final*** examination.

NO MAKE-UP EXAMS WILL BE GIVEN.

All examinations will be completed face-to-face.

The final exam is mandatory and comprehensive.

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

PERCENTAGE BREAKDOWN OF MARKS:

Homework 20%
Each Midterm Exam (20 %): 60%
Final Exam: 20%

Midterm Exam I: Wednesday, September 22nd
Midterm Exam II: Friday, October 24th
Midterm Exam III: Wednesday, November 12th
Final Exam: Tuesday, December 9th (8:00-10:00 am), WSB307

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.*

1. All assignments and homework need to be individually completed and not copied from another student's work.

2. You need to keep the due date and time.

3. The homework must be handwritten and submitted to Dr. Chang directly. This homework will not be accepted by my email [.pdf format must be used to submit]

SRSU Disability Services: ADA (Americans with Disabilities Act):

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 each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director at 432-837-8203 or email mschwartze@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine. Texas, 79832.

Course Calendar: The following pages include the course calendar. You need to focus on the date, lecture number, chapter number, topics, homework due day, and examination days. This course calendar could be changed. Before one week, your professor will let you know the changes.

Date	Lecture #	Chapter #	Topics	Due work
Aug. 25	Lecture 1	Ch 1	Discussion on Syllabus, a background in organic chemistry	
Aug. 27	Lecture 2		An overview of chemical bonding Lewis structures and formal charges, resonance structure	
Aug. 29	Lecture 3		Basics of hybridization, bond lengths, geometric isomerism, and three-dimensional formulas	
Sep. 3	Lecture 4		Structural basics of hydrocarbons; revision of Chapter 1	
Sep. 5	Lecture 5	Ch 2	Introduction to functional groups	**Ch1 HW**
Sep. 8	Lecture 6		Physical properties and molecular structure	
Sep. 10	Lecture 7		Intermolecular forces: revision on Chapter 2	
Sep. 12	Lecture 8		Overview of acid-base theories and reactions	
Sep. 15	Lecture 9	Ch 3	Factors affecting the acidity of compounds	**Ch2 HW**
Sep. 17	Lecture 10		Introduction to organic acids and bases, acid-base reactions involving organic molecules	
Sep. 19	Lecture 11		Revision on Ch 3 & Exam 1 Revision	
Sep. 22	Lecture 12	Review & Test	**Exam 1 day (Exam 1 covers ch 1, 2, & 3)**	**Ch3 HW**
Sep. 24	Lecture 13		Nomenclature of alkanes	
Sep. 26	Lecture 14	Ch 4	Physical properties of alkanes & cycloalkanes, and derivatives	
Sep. 29	Lecture 15		Conformational isomerism of alkanes and cycloalkanes	
Oct. 1	Lecture 16		Synthesis of alkanes and the index of hydrogen deficiency	
Oct. 3	Lecture 17		Revision on Ch 4	

Oct. 6	Lecture 18	Ch 5	Isomerism, constitutional and stereoisomers, chiral molecules	
Oct. 8	Lecture 19		Nomenclature and physical properties of enantiomers	**Ch4 HW**
Oct. 10	Lecture 20		Introduction to the synthesis of chiral molecules, molecules with more than one stereogenic center.	
Oct. 13	Lecture 21		Revision for Chapter 5	
Oct. 15	Lecture 22	Ch 9	Introduction to IR Spectroscopy, IR Spectroscopy & NMR Spectroscopy	
Oct. 17	Lecture 23		NMR Spectroscopy and Mass Spectroscopy (MS)	**Ch5 HW**
Oct. 20	Lecture 24		Revision on IR, NMR, and MS, Revision on Ch 9	
Oct. 22	Lecture 25	Review & Test	Exam 2 Revision	**Ch9 HW**
Oct. 24	Lecture 26		**Exam 2 day (Exam 2 covers ch 4, 5, & 9)**	
Oct. 27	Lecture 27	Ch 6	Nucleophilic substitution reactions, basic mechanism, kinetics, and examples of SN2, SN1 reaction mechanism S_N1 reaction mechanism	
Oct. 29	Lecture 28		Stereochemistry of nucleophilic, factors affecting the rate of S_N1 and S_N2 reactions, and substitution reactions	
Oct. 31	Lecture 29		Functional group transformation using S_N2 reactions; Revision on Chapter 6	
Nov. 3	Lecture 30	Ch 7	Introduction to elimination reactions, E2 and E1 mechanisms and examples, and substitution vs elimination	**Ch6 HW**
Nov. 5	Lecture 31		Synthesis of alkenes and alkynes by elimination reactions and the acidity of the terminal hydrogen of alkynes, hydrogenation of alkenes and alkynes	
Nov. 7	Lecture 32		Relative stability of alkenes, Addition of hydrogen halides to alkenes & synthesis of alcohol from alkenes via addition reactions	
Nov. 10	Lecture 33	Review & Test	Exam 3 Revision	**Ch7 HW**
Nov. 12	Lecture 34		**Exam 3 day (it covers Ch 6 & 7)**	

Nov. 14	Lecture 35	Ch 8	Electrophilic addition of hydrogen halides to alkenes and Markovnikov's rule, Ionic addition to an alkene	
Nov. 17	Lecture 36		Addition of halogens to alkenes and alkynes, oxidation of alkenes and alkynes	
Nov. 19	Lecture 37		Addition of water to alkenes, Hydration formation, Oxidative cleavage of alkenes, Ozonolysis of an alkene	
Nov. 21	Lecture 38		Revision on Ch 8	
Nov. 24	Lecture 39	Ch 10	Homolysis of alkyl halide, Free radical reactions of alkenes, Allylic radical and allylic substitution	**Ch 8 HW**
Dec. 1	Lecture 40		Radical addition to alkenes, Anti-Markovnikov addition of hydrogen bromide, Revision on Ch 10	
Dec. 3	Lecture 41	Review & Test	Final exam revision	
Dec. 9	Lecture 42		**Final Exam day, Tuesday, 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 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.

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 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 based on 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 a student complaint are in the student handbook.