

**SUL ROSS STATE UNIVERSITY**  
**Syllabus for Organic Chemistry I Laboratory**  
**CHEM 3407: L01 Fall 2022**

LAB: Organic Chemistry I LAB  
Room: WSB 305  
Time: Wednesday 3:00-5:50 pm  
Section: L01

TA: Hong Young Chang  
Office: WSB 219  
Email: hong.young.chang@sulross.edu  
Office Hours: TBD

***Required Laboratory Manual:*** “Techniques and Experiments for Organic Chemistry”, 6<sup>th</sup> Edition by A. Ault, **1998**, University Science Books (available from the SRSU Bookstore).

***Safety glasses*** are required for Organic Chemistry laboratories, which can be purchased from the SRSU Bookstore. You will NOT be allowed to participate in Organic Chemistry laboratories without safety glasses! Note: prescription glasses count as safety glasses.

Laboratory coats are recommended for Organic Chemistry laboratories, which can be purchased from the SRSU Bookstore.

- ***Calculator:*** A scientific calculator is required for this course.
- ***Cell phones*** **ARE NOT** permitted for use in exams and should be turned off during laboratory time.
- ***Please inform Dr. Chang and the Organic Chemistry TA if you are pregnant or get pregnant during this semester as chemicals used in the chemistry laboratory could have harmful effects on an unborn child and extra safety precautions and due diligence need to be taken into consideration during laboratory periods.***

## **OBJECTIVES:**

### ***Student Learning Objectives (SLO):***

A student graduating with a *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 to identify appropriate references for their paper.
4. Students will be become proficient at orally presenting scientific topics including the use of visual aids.

***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 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

***Expectations:***

- Read over the experiment before lab
- Follow all safety procedures:
- Shorts, flip-flops, chewing gum and open-toed shoes are ***NOT*** allowed in lab. If you come to class without appropriate clothing, you will be asked to leave. ***NO EXCEPTIONS!***

### ***Attendance:***

Coming to lab is mandatory. Be on time and SIGN IN at the beginning of the lab period. Plan to spend the entire period in lab. The TA may deduct points for students who arrive late or leave early.

If you ***miss 3 labs*** or more you will receive an automatic ***F*** for this course (i.e., this means you will ***fail the entire Organic I course*** including the lecture component, not just the lab section).

### ***Assignments:***

- Pre-Lab: Due at the beginning of the lab that the experiment will be performed.
- Lab Report: Due the lab period after the lab is done

### ***Lab Grading:***

- Each experiment is worth 30 points
- These points will come from:
  - The pre-lab (5)
  - The lab report (25)
- ***Assignments must be completed and turned in on time***
  - Assignments must be typed
  - Assignments and reports will be due the following week unless told otherwise
  - 10% of the grade will be deducted for assignments not turned in at the beginning of lab. An additional 10% will be deducted for each day that the assignment is late

### Outline for Written Pre-lab Reports

- **Aim:** Here you will state the goal of the experiment (in your own words).
- **Reagents:** You will make a list of all of the chemicals used in the experiment along with relevant data (grams, volume, molarity etc. that is indicated in your experiment).
- **Apparatus:** You will list all of the equipment that you will use.
- **Method:** This is where you will outline the steps in the experiment. The steps will be put in your own words.

### Outline for Written Lab Reports (Use MS Word or related program)

- **Aim:** Here you will state the goal of the experiment (in your own words).
- **Reagents:** You will make a list of all of the chemicals used in the experiment along with relevant data (grams, volume, molarity etc.). This is how much **YOU** used, not how much the manual asks for.
- **Apparatus:** You will list all of the equipment that you used.
- **Method:** This is where you will outline the steps in the experiment. Be sure to note any difference between what you did and what the manual said to do.
- **Data & Results:** Note the observations that you made during the experiment. What are your findings? (Percent yield, melting point, etc.)
- **Discussion:** Discuss your results and answer the questions that were asked in the **Data & Results** section of the experiment. Talk about the significance of your results. Were your results expected or unexpected? Why or why not?
- **Conclusion(s):** Summarize the key points and findings of the experiment. Was the experiment successful or unsuccessful?

### *Electronic Tool to draw chemical structures:*

You can download “ACD/Sketch” (software used to draw organic structures) onto your

own personal computer (PC or Mac) to make your laboratory reports more professional:

[ChemSketch Download for Academic and Personal Use | ACD/Labs \(acdlabs.com\)](http://acdlabs.com)

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

**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 each semester for each class. Students seeking accessibility/accommodations services must contact Rebecca Greathouse Wren, LPC-S, SRSU's Accessibility Services Coordinator at 432-837-8203 (please leave a message and we'll get back to you as soon as we can during working hours), or email [rebecca.wren@sulross.edu](mailto:rebecca.wren@sulross.edu). Their office is located on the first floor of Ferguson Hall (Room 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.*

**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 laboratory reports need to be individually completed and not copied from another student's work.***

## Organic Chemistry 3407 Lab Schedule

Date	Experiments
Aug. 24	No Laboratory Experiment
Aug. 31	Safety Video, Lab Tour, Equipment Checkout & introduction of ACD ChemSketch Chemical Drawing
Sep. 7	Introduction and demonstration of glasswares / tools / equipments commonly used in organic chemistry for conducting reactions and purifications Set-up glasswares for conducting Reflux and Solvent Distillation
Sep. 14	Introduction of Chromatography (p. 109) & Melting Point Measurement
Sep. 21	Recrystallization of Acetanilide (p. 48) & Demonstration of TLC
Sep. 28	Distillation of Methanol/Water Mixture (p. 62)
Oct. 5	Introduction of Spectroscopies (IR, NMR, or MS) (hand out)
Oct. 12	Cyclohexyl Bromide from Cyclohexanol (p. 384)
Oct. 19	Cyclohexene from Cyclohexanol (p. 376)
Oct. 26	Dehydration of 2-Methylcyclohexanol (p. 381)

Nov. 2	Vanillyl Alcohol from Vanillin (p. 493) & Lab Clean Up
Nov. 9	Online Final Exam (in Blackboard)