

SUL ROSS STATE UNIVERSITY
ANALYTICAL CHEMISTRY I: CHEM 2401 LAB (CRN: 22091)
SYLLABUS
Spring 2026

LAB: Analytical Chemistry I

TA: Dr. Hong Young Chang

Room: WSB 307

Email: hxc19tv@sulross.edu

Time: Tuesday 4:30-7:50 pm

Office: WSB 219

Office Hours: M-F(2:00-6:00pm)

Laboratory Manual: Handouts will be provided before each lab meeting. Bring a printed copy with you to the lab each week.

Calculator: A scientific calculator is required for this course.

Microsoft Excel Software: This software is also required for this course.

Cell phones ARE NOT permitted and should be turned off during laboratory time.

Expectations:

- Read over the experiment before lab
- Follow all safety procedures:

Shorts 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 the lab is mandatory. Be on time and SIGN IN at the beginning of the lab period. Plan to spend the entire period in the 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. This means you will fail the entire Analytical Chemistry I course including the lecture component, not just the laboratory section

Assignments:

Pre-Lab Write Up: Due at the beginning of the lab that the experiment is performed.

Lab Report: Due to 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)
- Attendance (5)
- The lab report (20)

Assignments must be completed and turned in on time. Assignments must be typed using Microsoft Word or a similar program. 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 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 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 Lab Reports (Use Microsoft 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 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 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 and 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?

ACD/ChemSketch is a computer program that you can use to draw molecular structures, chemical reactions, etc. You can download ACD/ChemSketch onto your own personal computer (PC or Mac):

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

If anyone is pregnant or gets pregnant during the semester, please inform your TA and Dr. Chang.

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.*

Analytical Chemistry I (CHEM2401) Lab Schedule

Date	Experiment
January 20	Safety Video, Lab Tour, Equipment Checkout
January 27	Performing Serial Dilution, Chemical Titration Techniques and handling Analytical balance
February 3	Calibration of glassware and pipet volume
February 10	Introduction of Excel for plotting experimental data
February 17	Micro-pipet Calibration using Excel for Statistics
February 24	Introduction to Analytical Spectrophotometry: Iron in water (UV-vis Spectroscopy)
March 3	Determination of Manganese in Environmental Waters (UV-vis Spectroscopy)
March 10	No laboratory Experiment (Spring Break)
March 17	Analysis of Transition Metal Oxides with Powder XRD
March 24	Introduction to Fourier-transform infrared spectroscopy (FT-IR / Amino acids)
March 31	Acid-Base Titration (Using NaOH titrate Acetic Acid)
April 7	TBD
April 14	Lab Cleanup
April 21	Final Test

Student Learning Outcomes (SLO) by SACSCOC:

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 an 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 the 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 become proficient at orally presenting scientific topics including the use of visual aids.

The SLOs as Core Curriculum Courses:

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. In addition, students will have opportunities for simple self-assessments on critical thinking.
2. Communication Skills – Students will have the opportunity to improve communication skills through oral discussion and writing reports (i.e., observation, explanation, conclusion, etc.) on the experiments done in the lab sessions. In addition, students will have opportunities for simple self-assessments on communication skills.
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.

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.

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 2023: 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 Timely Care where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/356 support by visiting Timely care/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 about 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 located in the student handbook.