

## SUL ROSS STATE UNIVERSITY

### Syllabus for GENERAL CHEMISTRY II: CHEM 1112:L01 (Spring 2020)

General Chemistry 2: Lab 01

Room: WSB 307

Time: Tues 1:00-2:50 pm

TA: TBD

Office: WSB 308

Email:

Hours: TBD

#### ***Required Laboratory Manual***

General Chemistry II: Laboratory Manual CHEM 1112 by Dr. Leaver, 2015 (available from the bookstore)

#### **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 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):***

A. 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

B. 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.

C. 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

D. 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

***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.

***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*.**

***Assignments:******Lab Manual Assignments:***

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

***Written Assignments:***

- Pre-Lab Write Up: Due at the beginning of the lab that the experiment is performed
- Lab Report: Due the lab period after the lab is done
- Guidelines for writing lab reports are shown on the next page and are found in your General Chemistry II Laboratory Manual

## Lab Grading:

- Each experiment is worth 30 points
- These points will come from:
  - o The pre-lab definitions (5)
  - o Attendance (5)
  - o The experiment work & on time submission of data & result sheets/written lab report (20)
  - o **Note:** Points will be deducted for not turning in lab reports data/results sheets on time
- Assignments must be completed and turned in on time
  - o Assignments must be legible
  - o Assignments and reports will be due the following week unless told otherwise
  - o 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 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 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 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?

**Students with Special Needs:** *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](mailto:rebecca.wren@sulross.edu) Students should then contact the instructor as soon as possible to initiate the recommended accommodations.*

*Please inform Dr. Chang and your 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.*

**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.

## General Chemistry 1112 Lab Schedule

<u>Date</u>	<i>EXPERIMENT</i>
<b>January 14</b>	<b><i>No Laboratory Experiment</i></b>
January 21	Safety Practices and Procedures in the Laboratory (Exp.1) & syllabus discussion
January 28	Heat of Reaction (Exp. 2)
February 4	Enthalpy of Solutions (Exp. 3)
February 11	Polymers: A Ticky-Tacky Plastic World (Exp. 4)
February 18	Colligative Properties (Exp. 5)
February 25	Rates of Chemical Reactions (Exp. 6)
March 3	Acid base Titration (Exp. 7)
<b>March 10</b>	<b><i>Spring Break (No classes)</i></b>
March 17	Determination of Dissociation Constant of a Weak Acid (Exp. 8)
March 24	Titration of Polyprotic Acids (Exp. 9)
March 31	Solubility Product & Common ion Effect (Exp. 10)
April 7	Qualitative Analysis of Cations (Exp. 11)
April 14	Qualitative Analysis of Anions (Exp. 12)
April 21	Lab Clean Up and Final