

General Chemistry I Lab (CHEM 1111)



Credit: 1 semester credit hour (2 hours lab)

Prerequisite: MATH 1332 or MATH 1314

Co-requisite: CHEM 1311 General Chemistry I

Course Description

Basic laboratory experiments supporting theoretical principles presented in CHEM 1311; introduction of the scientific method, experimental design, data collection and analysis, and preparation of laboratory reports.

Required Textbook and Materials

1. Safety Glasses or Goggles
2. 3 ring binder
3. Binder dividers with tabs (8)
4. Scientific calculator
5. Laboratory assignments printed from Blackboard

Course Objectives

Upon completion of this course, the student will be able to:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

Core Objectives

1. Critical Thinking Skills: To include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills: To include effective development, interpretation and expression of ideas through written, oral, and visual communication
3. Empirical & Quantitative Skills: To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusion
4. Teamwork: To include the ability to connect choices, actions, and consequences to ethical decision-making

Course Outline

- A. Safety/Lab Orientation
 - 1. Safety in Academic Laboratories
 - 2. "Starting with Safety" Video
 - 3. Identification of Lab Equipment
- B. Proper Bunsen Burner Usage
- C. Identification of Substances by Physical Properties-Density
 - 1. Density of rubber
 - 2. Density of water
 - 3. Identification of unknown solids by density
 - 4. Identification of unknown liquids by density
- D. Basic Laboratory Techniques
 - 1. Measurement
 - 2. Separation Methods
 - a. Gravimetric Filtration
 - b. Suction Filtration
 - c. Separatory Funnel
- E. Separation of a Mixture by Physical Properties
 - 1. Magnetism
 - 2. Sublimation
 - 3. Filtration
 - 4. Evaporation
- F. Identification of an Ionic Compound
 - 1. Cation tests
 - 2. Anion tests
 - 3. Flame tests
- G. Determination of the Empirical Formula of an Oxide
- H. Percent Composition of Hydrates
- I. Chemical Reactions
 - 1. A Series of Chemical Reactions of Copper
- J. Nomenclature
 - 1. Naming compounds
 - 2. Writing chemical formulas
- K. Covalent Bonding
 - 1. Model building
 - 2. VSEPR
- L. pH
 - 1. Determination of pH by indicators
 - 2. Titration
- M. Calorimetry/Specific Heat
- N. Core Assignment

Grade Scale

| | |
|----------|---|
| 90 – 100 | A |
| 80 – 89 | B |
| 70 – 79 | C |
| 60 – 69 | D |
| 0 – 59 | F |

Course Evaluation

Final grades will be calculated according to the following criteria:

| | |
|---|-----|
| 1. Pre-lab Assignments | 10% |
| 2. Lab Reports | 60% |
| 3. Safety and Equipment Quizzes and Assignments | 20% |
| 4. Core Assignment | 10% |

Course Requirements

1. Pre-lab Assignments on Blackboard.
2. Written lab reports.
3. Safety and equipment quizzes and assignments in class and on Blackboard.
4. Core Assignment.

Course Policies

1. **SAFETY GLASSES OR GOGGLES MUST BE WORN AT ALL TIMES IN THE LAB, NO EXCEPTIONS.**
2. **LAB APRONS MUST BE WORN AT ALL TIMES IN THE LAB, NO EXCEPTIONS.**
3. Students will not be automatically dropped from the class due to poor attendance or grades. The student is responsible for initiating and completing the drop process. Discontinuing class attendance without properly submitting a drop request will result in a failing grade (F).
4. Students are expected to stay for the full duration of the lab period or until all data is taken, calculations are performed and the lab assignment is turned in. Reports are to be neat and complete. **DO NOT USE RED INK.** Corrections should be made by a single line through the incorrect data and the correction entered next to the old data.
5. Safety rules must be abided by at all times. Any student who continually breaks the safety rules will be removed from the class to insure the safety of the other students in the class.
6. Clean up the work station and the glassware used during the experiment. Points will be deducted for poor laboratory habits and leaving dirty glassware and dirty work station behind.
7. No food, drinks, or use of tobacco products in lab.
8. During class time, **all electronic devices need to be turned to silent or off,** unless prior approval has been given by instructor to have them set to vibrate. (Permission will only be given in emergency situations.)

It shall be considered a breach of academic integrity (cheating) to use or possess on your body any of the following devices during any examination unless it is required for that examination and approved by the instructor:

- **Cell phone**
- **smart watch/watch phone**
- **laptop**
- **tablet**
- **electronic communication devices (including optical)**
- **earphones connected to or used as electronic communication devices.**

1st Offense: The exam will be taken from the student and the student will receive a grade of ZERO (0) for the exam which will be averaged into the student's class average and there will be NO MAKEUP of the test.

2nd Offense: The student will be removed from the class and will receive a grade of FAILING (F) for the entire lecture and lab grade. Students with special needs and/or medical emergencies or situations should communicate with their instructor regarding individual exceptions/provisions. It is the student's responsibility to communicate such needs to the instructor.

8. Children are not allowed in the laboratory at any time.
9. Attendance in lab is mandatory. Two absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Missed labs may be made up within one week without penalty at the instructor's discretion. Labs not made up within two weeks will result in a grade of zero (0). A lab that is one day to one week late will incur a 20 point penalty. A lab that is more than one week, but less than two weeks late will incur a 50 point penalty. At the end of the semester, three missed labs (grades of 0) will result in an automatic failing grade (F) for the course.
10. Additional class policies as defined by the individual course instructor.

Technical Requirements

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:

https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support/Browser_Checker A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Disabilities Statement

The Americans with Disability Act of 1990 and Section 504, Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the American with Disability Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)839-2018. You may also visit the online resource at [Special Populations - Lamar Institute of Technology \(lit.edu\)](http://SpecialPopulations-LamarInstituteofTechnology(lit.edu))

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services

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Course Syllabus

Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document

Starfish

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.

<https://lit.edu/student-success/starfish>