

## **Introductory Chemistry I (CHEM 1306) (Lecture, Allied Health emphasis)**



**Credit:** 3 semester credit hours (3 hours lecture)

**Prerequisite:** Passed the math portion of TSI or other accepted testing instrument.

### **Course Description**

Survey course introducing chemistry. Topics may include inorganic, organic, biochemistry, food/physiological chemistry, and environmental/consumer chemistry. Designed for non-science and allied health students.

### **Required Textbook and Materials**

1. *Chemistry: An Introduction to General, Organic and Biological Chemistry*, 13<sup>th</sup> Edition by Karen C. Timberlake.
  - a. ISBN number is 13: 978-0-13-442135-3.
2. Mastering chemistry access code (combined with the book or standalone). Access it via Blackboard under “Mastering Chemistry” folder. Course ID: **guo47969**
3. Scientific calculator.
4. Scantrons.
5. #2 pencils.
6. Internet access via a laptop, a tablet, or a smart phone.

### **Recommended**

1. *Study Guide and Selected Solutions Manual for Chemistry: An Introduction to General, Organic, and Biological Chemistry*, 13th Edition by Karen C. Timberlake.
  - a. ISBN number is 13: 978-0-13-455398-6

### **Course Objectives**

Upon the completion of this course students should be able to:

1. Define the fundamental properties of matter.
2. Classify matter, compounds, and chemical reactions.
3. Determine the basic nuclear and electronic structure of atoms.
4. Identify trends in chemical and physical properties of the elements using the periodic table.
5. Describe the bonding in and the shape of simple molecules and ions.
6. Solve stoichiometric problems.
7. Write chemical formulas.
8. Write and balance equations.
9. Use the rules of nomenclature to name chemical compounds.
10. Define the types and characteristics of chemical reactions.
11. Identify general characteristics of organic compounds

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Course Syllabus

**CORE Objectives**

1. Critical Thinking: to include creative thinking, innovation, inquiry, and analysis.
2. Communication: to include effective development, interpretation and expression of ideas through written, oral and visual communications.
3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
4. Teamwork: to include the ability to consider different points of view, and to work effectively with others to support a shared purpose or goal.

**Course Outline**

- A. Chemistry in Our Lives
  1. Chemistry and Chemicals
  2. Scientific Method: Thinking Like a Scientist
  3. Studying and Learning Chemistry
  4. Key Math Skills for Chemistry
  5. Writing Numbers in Scientific Notation
- B. Chemistry and Measurements
  1. Units of Measurement
  2. Measured Numbers and Significant Figures
  3. Significant Figures in Calculations
  4. Prefixes and Equalities
  5. Writing Conversion Factors
  6. Problem Solving Using Unit Conversion
  7. Density
- C. Matter and Energy:
  1. Classification of Matter
  2. States and Properties of Matter
  3. Temperature
  4. Energy
  5. Energy and Nutrition
  6. Specific Heat
  7. Changes of State
- D. Atoms and Elements:
  1. Elements and Symbols
  2. The Periodic Table
  3. The Atom
  4. Atomic Number and Mass Number
  5. Isotopes and Atomic Mass
  6. Electron Energy Levels
  7. Trends in Periodic Properties
- E. Ionic and Molecular Compounds:
  1. Ions: Transfer of Electrons
  2. Ionic Compounds
  3. Naming and Writing Ionic Formulas
  4. Polyatomic Ions
  5. Molecular Compounds: Sharing Electrons
  6. Lewis Structures for Molecules

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7. Electronegativity and Bond Polarity
  8. Shapes of Molecules
  9. Polarity of Molecules and Intermolecular Forces
- F. Chemical Quantities and Reactions:
1. The Mole
  2. Molar Mass
  3. Calculations Using Molar Mass
  4. Equations for Chemical Reactions
  5. Types of Chemical Reactions
  6. Oxidation–Reduction Reactions
  7. Mole Relationships in Chemical Equations
  8. Mass Calculations for Chemical Reactions
- G. Gases
1. Properties of Gases
  2. Pressure and Volume (Boyle’s Law)
  3. Temperature and Volume (Charles’s Law)
  4. Temperature and Pressure (Gay-Lussac’s Law)
  5. The Combined Gas Law
  6. Volume and Moles (Avogadro’s Law)
  7. Partial Pressures (Dalton’s Law)
- H. Solutions
1. Solutions
  2. Electrolytes and Nonelectrolytes
  3. Solubility
  4. Solution Concentrations
  5. Dilution of Solutions
  6. Properties of Solutions
- I. Acids, Bases and Equilibrium
1. Acids and Bases
  2. Brønsted–Lowry Acids and Bases
  3. Strengths of Acids and Bases
  4. Acid–Base Equilibrium
  5. Dissociation of Water
  6. The pH Scale
  7. Reactions of Acids and Bases
  8. Buffers
- J. Introduction to Organic Chemistry
1. Identify general characteristics of Organic Compounds

### Grade Scale

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

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### Course Evaluation

Final grades will be calculated according to the following criteria:

1. Homework	20%
2. Test # 1	15%
3. Test # 2	15%
4. Test # 3	15%
5. Common assignment	15 %
6. Final exam	20%

### Course Policy

1. No food, drinks, or use of tobacco products in class.
2. 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.

3. Do not bring children to class.
4. No late assignment will be accepted.
5. No make-up exams will be given. In case of an emergency (**a proof must be submitted**), the final exam will replace the grade of the missed exam. **It is the student's responsibility to obtain missed lecture notes and class handouts and assignments.**
6. Attendance policy: Roll will be taken daily at the beginning of the class. If you walk in after attendance has been taken you will be counted absent. Your attendance is documented by using LIT Starfish system.
7. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an F in the course.

### **Technical Requirements (for courses using Blackboard)**

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

[https://help.blackboard.com/en-us/Learn/9.1\\_2014\\_04/Student/015\\_Browser\\_Support/015\\_Browser\\_Support\\_Policy](https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy)

A functional broadband internet connection, such as DSL, cable, or Wi-Fi 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://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](http://www.lit.edu) or obtained in print upon request at the Student Services 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>