IV. Student Learning Outcomes:
After successful completion of this course, students will be able to do the following:

1. GENERAL SCIENCE, LABORATORY SCIENCE, AND MICROSCALE
   - Apply the scientific method and use empirical data and observations to construct a sound scientific explanation.
   - Distinguish between macroscopic observables and the underlying microscopic properties of matter by interpreting and representing matter using molecular-level drawings.

2. CHEMICAL PROBLEM SOLVING
   - Develop strong problem-solving skills that are supported by basic algebraic and numeracy skills.
   - Demonstrate fluency in chemical vocabulary and symbolic representation.
   - Use measurable quantities of matter to determine physical and chemical properties.
   - Use stoichiometric calculations to predict quantities.

3. ATOMS, MOLECULES AND IONS
   - Describe the general structure of an atom.
   - Explain the historical development of the atomic theory and the evolution of the current modern atomic model.
   - Explain the relationship between the position of an element in the periodic table and its physical/chemical properties, including periodic trends.
   - Describe the differences in the structure and properties of substances based on different types and models of bonding.

4. STATES OF MATTER: GASES, LIQUIDS AND SOLIDS
   - Compare and contrast the properties of the three states of matter.
   - Use kinetic-molecular theory to explain gas behavior.
   - Describe intermolecular forces and chemical bonds and how they influence physical and chemical properties and changes.

5. PHYSICAL AND CHEMICAL CHANGES AND REACTIONS
   - Recognize and describe changes in heat and temperature associated with physical and chemical changes.
   - Classify and balance chemical reactions and predict products for different types of reactions.
   - Apply the properties of ionic and molecular substances in aqueous solution to describe systems and predict behavior.