

General Chemistry	Code & No:	GE 107
	Credits:	3 (3,0,1)
	Pre-requisite:	None
	Co-requisite:	None
	Level:	6

Course Description: This course includes the following main topics:

Introduction, The study of chemistry, Physical and chemical properties of matter, Atoms, Molecules and Ions, The Atomic theory, The Electronic structure of Atoms, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom, The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration, Periodic Table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Chemical Bonding, Formation of sodium chloride, Electrochemistry, Redox reactions, Batteries, Acids and Bases, Bronsted acids and bases, Lewis acids and bases, PH- a measure of acidity, Chemistry in the Atmosphere.

Course Aims:

1. Gain the knowledge of the basic concepts and principles of Chemistry.
2. Understand the concepts and principles of Chemistry.
3. Analyse the chemical problem and can able to express it as a chemical equation.
4. Apply the basic principles of chemistry in solving problems in a structured process.
5. Able to use necessary techniques and skills in solving chemical problems.

Student Outcomes (SOs):

- (a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- (c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- (d) An ability to function effectively on teams to accomplish a common goal
- (e) An understanding of professional, ethical, legal, security and social issues and responsibilities
- (f) An ability to communicate effectively with a range of audiences
- (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society

No.	Topics	Weeks	Teaching hours
1	<u>Introduction</u> : The study of chemistry, the scientific method, classifications of matter, Physical and chemical properties of matter, measurement, Handling Numbers, Dimensional Analysis in solving problems.	1	3
2	<u>Atoms, Molecules and Ions</u> : The Atomic theory, The structure of Atom, Atomic Number, Mass Number and Isotopes, The Periodic Table, Molecules and Ions, Chemical formulas, Naming Compounds, Introduction to Organic compounds.	3	9
3	<u>The Electronic structure of Atoms</u> : From Classical Physics to quantum theory, the Photoelectric effect, Bohr's Theory of the Hydrogen Atom, The Dual Nature of the Electron, Quantum Mechanics, Quantum Numbers, Atomic orbitals, Electronic Configuration, The Building-Up Principle.	2	6
4	<u>Periodic Table</u> : Development of the Periodic table, Periodic Classification of the elements, Periodicity of properties, Ionization energy, Electron affinity.	1	3
5	<u>Chemical Bonding</u> : Lewis Dot Symbols, The Ionic Bond, Lattice Energy of Ionic Compounds, Formation of Sodium chloride, The Covalent bond, Electronegativity, Writing Lewis structures, Formal charge and Lewis Structure, Resonance, Exceptions to the Octet Rule .	2	6
6	<u>Electrochemistry</u> : Redox reactions, Balancing redox equations, Galvanic cells, Batteries.	1	3
7	<u>Acids and Bases</u> : Arrhenius concept of acids and bases, Bronsted acids and bases, Lewis acids and bases, The Acid-Base Properties of Water , PH- a measure of acidity.	2	6
8	<u>Chemistry in the Atmosphere</u> : Earth's Atmosphere, Phenomena in the outer layers of Atmosphere, Depletion of ozone in the stratosphere, volcanoes,	2	6

	The greenhouse effect, Acid rain , Photo chemical smog, Indoor pollution.		
	Total	14	42

Textbook:

- Chemistry by Raymond Chang, Kenneth Golds by, 12th. Edition. McGraw – Hill Higher education, ISBN-13: 978-007-8021510, 2015.

Essential references:

- General Chemistry: Principles and Modern Application, 11th edition, by Ralph H. Petrucci (Author), William S Harwood (Author), Geoff E Herring (Author), Jeff Madura (Author), ISBN-13: 978-0132388269, ISBN-10: 013238826X, 2017.