



General Chemistry

| Course Code | Course Num. | Course Name | Credit Hours | Lec | Lab | Tut | Prerequisites |
|-------------|-------------|-------------------|--------------|-----|-----|-----|---------------|
| CHE | 101 | General Chemistry | 4 | 4 | 2 | 0 | |

Objectives:

To familiarize the student with the basic principles and concepts of Inorganic Chemistry.

Syllabus:

- **Atoms, Molecules and Ions:** The atomic theory, the structure of the atom, Atomic number, Masse number and Isotopes, the periodic table, Molecules and ions, Chemical formulas, Naming compounds
- **Masse Relationships in chemical reactions:** Atomic mass, Avogadro's number and molar mass, Molecular mass, the mass spectrometer, Experimental determination of empirical formulas, chemical reaction and chemical equations, Amounts of reaction and reactants and products, Limiting reagents
- **Reaction in aqueous solutions:** General proprieties of aqueous solutions, Precipitation reactions, Acid-Base reactions, Oxidation-Reduction reactions; Concentration solutions, Gravimetric Analysis, Acid Base Titrations, Redox Titrations.
- **Gases:** Substance that exist as Gases, Pressure of a Gas; The Gas Laws, The ideal gas equation, Gas Stoichiometry, Dalton's Law of Partial Pressures; The kinetic molecular theory of gases.
- **Intermolecular forces and liquids and solids:** The kinetic molecular theory of liquids and solids, Intermolecular forces, Proprieties of liquid, Phase changes, Phase Diagrams.
- **Physical proprieties of solutions:** Types of solutions, a molecular view of the solutions process, concentration units, the effect of the temperature on the solubility, the effect of pressure on the solubility of gases, colloids
- **Chemical equilibrium:** The concept of equilibrium and the equilibrium constant, writing equilibrium constant expression, the relationship between chemical kinetics and chemical equilibrium, what does the equilibrium constant tell us? Factor that affect chemical equilibrium.
- **Chemical Kinetics:** The rate of reaction, the rate Law, the relationship between reactant concentration and time, Activation Energy and temperature dependence of rate constants, reaction mechanisms, Catalysis.
- **Molecule bonding:** Molecular geometry, dipole Moment, valance bond theory, Hybridization of atomic orbitals, Molecular orbital theory, Molecular orbital configurations,

References:

- **Chemistry**, Raymond Chang, Williams College, Mc Graw Hill, Higher Education, 9th Edition.
- **Chemistry & Chemical Reactivity**, by Kotz, John C. & Treichel, Paul, 5th edition

