# (CY-106) - Chemistry

## Course Outline:

**Theory:**

1. **Introduction**:
    1. Wave properties of electrons and matter.
    2. Quantum theory of matter at atomic level, atomic structure.
    3. Energy levels, orbital, hydrogen spectrum, bond energy, molecular structure and its rotational and vibration energy.
2. **Chemical Bonding:**
    1. Types of Bonds, Hybridization and Theories of Bonding.
    2. Valence Shell Electron Pair Repulsion Theory and Molecular Orbital Theory.
    3. Physical state of matter.
    4. Gas laws, properties of liquid, surface tension, viscosity, optical activity, dielectric constant, polarization, dipole moment.
    5. Crystal structure.
3. **Chemical Kinetics:**
    1. Rate of reaction.
    2. order of reaction.
    3. First, Second and third order reaction.
    4. factors affecting rate of reaction like Pressure, Temperature, Concentration, Catalyst, Surface Area and Volume.
4. **Electrochemistry:**
    1. oxidation and reduction reactions.
    2. Balancing of redox reaction in acidic and basic medium.
    3. Construction of galvanic cell.
5. **Organic chemistry:**
    1. Introduction and classification of organic compounds.
    2. Saturated and unsaturated hydrocarbons.
    3. Chemistry of Alkanes, Alkynes,Alkenes and Aromatics.
    4. Nucleophilic and Electrophonic substitution Reactions.

## Lab Outline:

1. Order of reaction.
2. factors affecting rate of reaction.
3. acid-base titrations.
4. Redox's titrations.
5. preparation of Acidic and Basic buffer solutions and mixture analysis.

## Suggested Assessment:

**Theory (100%)**

- Sessional (20%)
- Quiz (12%)
- Assignment (8%)
- Midterm (30%)
- Final Term (50%)

**Laboratory (100%)**

## Text and Reference Books:


1. Silberberg Chemistry: The Molecular Nature of Matter and Change. McGraw Hill.
2. John, R. Holum: Elements of General, Organic and Biological Chemistry. John Wiley & Sons ____