B. Sc. General in Chemistry

Programme Specific Outcome (PSO)

By the end of the program B. Sc. General in Chemistry, the student will be able to:

- Students should discuss and analysechemical concept through qualitative and quantitatively and apply them in day to day life.
- Development of preparation and measurement skill in different chemical aspects.
- Chemical industry related concept and skill development.
- This syllabus can increase basic knowledge of chemistry with practical skill of the student.
- Student can learn to operate different types of instrument.
- This course encourages the student for higher study.

Course Outcome (CO)

- **CHEMGDS01A(CC-01)**

Inorganic Chemistry

Atomic Structure

Outcomes:

- Student can learn about different model of atomic structure with proper explanation.
- Quantum mechanics and H-spectra.
- Orbitals and electronic configuration.

Chemical Bonding and Molecular Structure

Outcomes:

- Acquire the Concept of ionic bond.Fajans rule, Lattice energy, Concept of covalent bond
  VBT and VSEPR theory and MO& LCAO
  Fundamentals of Organic Chemistry
- Student can understand different type of Physical Effects, Electronic Displacements Organic acid base, Aromaticity:Huckels rule, spatial arrangement of molecule Concept of chirality, Isomerism, CIP rule and aliphatic hydrocarbons.

CHEMGDS01A(CC-01)(P)

Outcomes:

Section A:

Inorganic Chemistry - Volumetric Analysis

Outcomes:

Section B: Organic Chemistry

Student can develop their quantitative analysis skill through volumetric titration.

Outcomes:

Student will able to detect special element in organic compound.

Chromatographic separation technique

CHEMGDS-1B (CC-02)

Section A: Physical Chemistry-1

Outcomes:

- Student will develop the knowledge about Laws of Thermodynamics, different aspect of enthalpy, Kirchoof's equation and third law of Thermodynamics.
- Student can learn about Free energy change, Thermodynamic derivation of the law of chemical equilibrium, ΔG, and Le Chatelier's principleKp, Kc and Kx.
- Student can know about Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble.

Section B: Organic Chemistry-2

Outcomes:

- Student can learn about preparation and reaction of aromatic hydrocarbon, Alkyl and Aryl Halides, Alcohols, Phenols and Ethers and Aldehydes and ketones.

CHEMGDS1BP

Section A: Physical Chemistry

Outcomes:

Student can develop their skill to determine enthalpy of different system and preparation of buffer.

Section B: Organic Chemistry

Outcomes:

Student can experience the knowledge about Purification of organic compounds, Determination of melting and boiling points and Preparations.

CHEMGDS1CP

(CC-03)

Section A: Physical Chemistry-2

Outcomes:

- Student will know about Thermodynamics of ideal solutions,Raoult's law – non-ideal solutions. Vapour pressure-composition, Lever rule, Azeotropes, Critical solution temperature, Nernst distribution law and solvent extraction.
- Student can learn about Phases, components and degrees of freedom of a system, Gibbs Phase Rule, Derivation of Clausius – Clapeyronequation, Phase diagrams.
- Students will gather knowledge aboutConductivity, Kohlrausch law, Hittorf and Moving boundary methods, Ionic mobility , degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of a salt and Conductometric.
- Student will know about Reversible and irreversible cells, EMF, Nernst equation Standard electrode potential, Thermodynamics of a reversible cell, Liquid junction potential and salt bridge andpH determination using hydrogen.

Section B:
Organic Chemistry-3

Outcomes:

- Student can learn about preparation and reaction of Carboxylic acids and their derivatives, Amines and Diazonium Salts, Amino Acids, Peptides and Proteins,Carbohydrates.

CHEMGDS-01CP

Section A: Physical Chemistry

Outcomes:

Student can gather practical knowledge about distribution, phase equilibria, conductance, Potentiometry and some organic synthesis and separation technique.

CHEMDS-1D(CC-04)

Outcomes:

- Student can learn about the property and reaction of transition element.
- Student can know about co-ordination chemistry and CSFE.
- Students will gather knowledge about nature and behaviour of gases, liquid and soild.
- Student can know about kinetics parameter of chemical reaction.
- **CHEMDS-1D(CC-04)(P)**
- **Outcomes:**

Section A:
Inorganic Chemistry

Outcomes:

- Student can develop their qualitative aptitude for detection ions with some quantitative estimation of ion.

Section B: Physical Chemistry

Outcomes:

- Student can practically learn Surface tension, viscometer and rate determination.

CHEMGDS-01:
Analytical Methods in Chemistry

Outcomes:

- Development the aptitude about Qualitative and quantitative aspects of analysis.
- Student can know about different type of spectrophotometric analysis.
- Student can learn about thermogravimetry and different separation technique.

DSE1P: Analytical methods in Chemistry

Outcomes:

Student can gain practical knowledge about chromatography, solvent extraction and spectro photometry.

CHEMGDS-02:
Quantum Chemistry, Spectroscopy & Photochemistry
Outcomes:

- Student can learn about particle in a box concept in quantum chemistry.
- Student can learn about vibrational energy and angular quantum concept.
- Relation of quantum mechanics with simple MO of di atomic molecule.
- Student can learn aboutRotation spectroscopy,Vibrational spectroscopy, Raman spectroscopy,Electronic spectroscopy, Nuclear Magnetic Resonance (NMR) spectroscopy, Electron Spin Resonance (ESR) spectroscopy.
- Student can know about photochemistry.

CHEMGDS2P: Practical
Outcomes:

Student can gain practical knowledge about spectrophotometric and colorimetric estimation.