

DEPARTMENT OF CHEMISTRY

Programme: B Sc. (Chemistry)

Statement of Programme Specific Outcomes (PSOs)

By the end of this course, the students will be able to:

1. Interpret spectra of organic compound
2. Perform qualitative and quantitative estimates
3. Operate different instruments used in chemical analysis
4. Synthesize organic as well as inorganic compounds
5. Determine the rate, mechanism and kinetics of various chemical reactions
6. Discuss various theories of chemical bonding
7. Perform any job in quality control department of industry
8. Participate and represent in seminars, workshops at national and international level.

Statement of Course Outcomes (COs)

Course: Inorganic Chemistry SEM-I

Course Outcomes: By the end of this course, the students will be able to:

1. Understand atomic structure and different rules with reference to electronic configuration
2. Discuss chemical bonds and different theories related to chemical bonding
3. Explain the comparative account of S-block elements.
4. Summarize the hydrides oxides, peroxy acids of P-block elements.
5. Design the structure of diborane and borazine

Course: SEM-I Physical Chemistry

Course Outcomes: By the end of this course, the students will be able to:

1. Understand kinetics gas model different gas laws and ideal and real gases
2. Analyze the structural difference between different states of matter
3. Explain the surface tension viscosity and their applications
4. Understand surface phenomenon and its application
5. Understand the role of enzymes as a catalyst
6. Understand the basic concepts of thermodynamics and thermo chemistry

Course: LAB Sem 1

Course Outcomes: By the end of this course, the students will be able to:

1. Analyze viscosity given inorganic mixtures
2. Determine viscosity and surface tension of given liquid
3. Analyze cleansing action of different detergents
4. Construct various crystal models.

Course: Organic Chemistry SEM-II

Course Outcomes: By the end of this course, the students will be able to:

1. Understand hybridization and can construct models
2. Explain different terms involved in organic reaction mechanism.
3. Write different stereo chemical formulae of organic compounds
4. Write IUPAC names of alkenes and alkynes.
5. Define dienes, alkynes and alkenes.

Course: Physical Chemistry SEM-II

Course Outcomes: By the end of this course, the students will be able to:

1. Understand second law of thermodynamics, free energy and work function.
2. Define phase rules with its terms involved and application of phase rules
3. Understand Raoult's Law, Henry's law and Nernst's distribution law.
4. Understand conductance, its types and mobility of ions.
5. Explain transport no., methods for determination of transport no
6. Compare between first, second and third order reactions and their method of determination of order of reaction.

Course: LAB (Chemistry SEM II)

Course Outcomes: By the end of this course, the students will be able to:

1. Identify different extra element and functional group from given organic compound
2. Identify accurate and precise melting point of organic compound
3. Determine heat of solution and ionization
4. Construct phase diagram of three component system.

Course: Inorganic Chemistry SEM-III

Course Outcomes: By the end of this course, the students will be able to:

1. Construct molecular or orbital diagram of diatomic molecules.
2. Understand characteristic properties of first transition series elements
3. Write the electronic configurations of Lanthanides and Actinides.
4. Classify second and third transition series elements.

Course: Organic Chemistry SEM-III

Course Outcomes: By the end of this course, the students will be able to:

1. Explain reactivity at ortho and para positions of benzene ring.
2. Compare SN1 and SN2 reactions
3. Criticize use of BHC and DDT
4. Classify different alcohols and phenols
5. Summarize different mechanisms of carbonyl compounds.

Course: LAB Chemistry SEM-III

Course Outcomes: By the end of this course, the students will be able to:

1. Determine the percentage of acetic acid in a given commercial vinegar sample
2. Calculate temporary and permanent hardness in given water sample
3. Analyze given organic compound
4. Prepare derivatives of given organic compound.

Course: Inorganic Chemistry SEM-IV

Course Outcomes: By the end of this course, the students will be able to:

1. Differentiate simple salt, double salt and complexes.
2. Understand the isomerism in coordination compounds
3. Analyze the redox cycle
4. Explain the role of trace elements in biological processes
5. Differentiate hard and soft acids and bases.

Course: Physical Chemistry SEM-IV

Course Outcomes: By the end of this course, the students will be able to:

1. Compare first and second law of thermodynamics
2. Understand the concepts of system of variable composition
3. Understand the basic concepts of electrochemistry
4. Write cell reactions to calculate electrode potential.
5. Understand dipole moment and its application
6. Explain rotational spectra and its application

Course: LAB Chemistry SEM-IV

Course Outcomes: By the end of this course, the students will be able to:

1. Understand importance of gravimetric estimation
2. Separate binary mixture by chromatographic technique R_f values.
3. Operate conductometer and potentiometer.
4. Construct Born-Haber Cycle and lattice energy of ionic solids.

Course: SEM-V Organic Chemistry

Course Outcomes: By the end of this course, the students will be able to:

1. Understand chemistry of aliphatic and aromatic nitrogen containing compounds.
2. Justify the occurrence of heterocyclic compounds and identify in medicines
3. Analyze the percentage composition of different elements like CHNX
4. Explain the reactivity of different organometallic compounds.
5. Identify various electronic transitions occur in different organic compounds.

Course: SEM-V Physical Chemistry

Course Outcomes: By the end of this course, the students will be able to:

1. Understand the failure of classical mechanics
2. Criticize Bohr's model of an atom

3. Derive Schrödinger wave equation in 1D and 3D box
4. Compare bonding and non-bonding orbital
5. Calculate the solution
6. Understand the interaction of radiation with matter

Course: LAB Chemistry SEM-V

Course Outcomes: By the end of this course, the students will be able to:

1. Perform quantitative estimation of glucose amide and nitro group
2. Verify Beer-Lambert's law by colorimeter
3. Determine molar mass by Rast's method
4. Predict zero order reaction of iodination of acetone.

Course: SEM VI Inorganic Chemistry

Course Outcomes: By the end of this course, the students will be able to:

1. Discuss the crystal field theory of coordination compounds
2. Interpret electronic spectra of transition metal complexes
3. Understand the difference between thermodynamics and kinetic stability of metal complexes
4. Understand the different instrumental and separation techniques used in chemistry
5. Compare different types of silicon

Course: Organic Chemistry SEM-VI

Course Outcomes: By the end of this course, the students will be able to:

1. Determine structure of organic compounds on the basis of NMR spectroscopy
2. Understand the importance and role of formation of enolate ions
3. Explain the importance of biomole clues such as carbohydrate, proteins and fats
4. Understand cleansing action and differentiate between soap and detergent
5. Understand preparation and application of polymers, synthetic dyes and synthetic drugs

Course: LAB Chemistry SEM-VI

Course Outcomes: By the end of this course, the students will be able to:

1. Prepare inorganic complexes
2. Predict the geometry of complexes and determine its magnetic properties.
3. Identify the solvent to be used for the separation of binary mixtures
4. Separate the binary mixtures and identify the organic compounds in the mixture.