

B.Sc. Chemistry

Programme Outcomes

- PO-1. Read, understand and interpret chemical information – verbal, mathematical and graphical.
- PO-2. Impart skills required to gather information from resources and use them.
- PO- 3. To give need based education in chemistry of the highest quality at the undergraduate level.
- PO- 4. Perform experiments and interpret the results of observation.
- PO -5. Provide an intellectually stimulating environment to develop skills and enthusiasm of students to the best of their potential.
- PO- 6. Use Information Communication Technology to gather knowledge at will.
- PO- 7. To bridge the gap between plus two and post graduate levels of Chemistry by providing a more complete and logical framework in almost all areas of basic Chemistry.

PROGRAM SPECIFIC OUTCOMES (PSO)

- PSO-1. Learn Chemistry through lectures, laboratory sessions, tutorials and interaction with eminent academicians.
- PSO-2. Develop laboratory skills for qualitative and quantitative analysis, organic synthesis, distillation, filtration, crystallization and chromatography.
- PSO-3. Safe working procedures, chemical toxicology, environmental concerns, handling of chemicals, glassware and range of instruments available at graduation level.
- PSO-4. Kindle the urge for higher studies, entrepreneurship and lifelong learning.

Course Outcomes (CO)

SEMESTER I

CH1CRT01 – GENERAL AND ANALYTICAL CHEMISTRY

CO-1 To understand the methodology of chemistry

CO-2 To familiarise the periodic properties and periodic table

CO-3 To get concrete knowledge on analytical chemistry

CO-4 To get acquaintance with chromatographic techniques

CO-5 To evaluate analytical data

SEMESTER II

CH2CRT02 – THEORETICAL AND INORGANIC CHEMISTRY

CO-1 Develop a deep knowledge on atomic structure

CO-2 To understand various theories of chemical bonding

CO-3 Get concrete knowledge on s-block, p-block, d-block and f-block elements

CH2CRP01 - VOLUMETRIC ANALYSIS

CO-1 Get practice with acidimetry, alkalimetry, complexometry and redox titrations

CO-2 Able to apply the volumetric knowledge in commercial samples.

SEMESTER III

CH3CRT03- ORGANIC CHEMISTRY I

CO-1 Understanding the fundamentals of organic chemistry and organic reactions

CO-2 Identifying the rules related to IUPAC nomenclature

CO-3 Appreciating the beauty of stereochemistry of organic molecules in terms of various conformations and their stability

CO-4 Understanding the various reactions involved in the synthesis of aliphatic and aromatic hydrocarbons

CO-5 Familiarising the basics of pericyclic reactions with examples

SEMESTER IV

CH4CRT04- ORGANIC CHEMISTRY II

CO-1 Understand the various functional organic compounds and their synthesis

CO-2 Familiarise the fundamental difference in chemical and physical properties of different functional groups

CO-3 Able to distinguish between organic compounds using various organic reactions

CO-4 Learn rearrangement reactions with their detailed mechanisms

CH4CRP02 - QUALITATIVE ORGANIC ANALYSIS

CO-1 Systematically analyse organic compound and preparation of solid derivative

CO-2 To determine the physical constants of solids and liquids – melting and boiling points

CO-3 To understand the reactions of various functional groups

SEMESTER V

CH5CRT05-ENVIRONMENT, ECOLOGY AND HUMAN RIGHTS

CO-1 To understand the fragility and sensitivity of our environment and the importance of its protection.

CO-2 To promote environmental awareness

CO-3 To foster a sense of responsibility and proactive citizenship

CH5CRT06- ORGANIC CHEMISTRY –III

CO -1 To give concrete idea about nitrogen containing compounds and their synthesis.

CO- 2 To familiarize with the vast world of heterocyclic compounds

CO- 3 To provide a brief idea about active methylene compounds and drugs.

CO -4 To get acquainted with carbohydrates, polymers and dyes.

CH5CRT07 – PHYSICAL CHEMISTRY - I

CO-1 Behaviour of ideal gases and the real gases. A deeper look on the distribution of velocities and energies among the molecules, an overview on the collision properties.

CO-2 To develop a qualitative idea about the intermolecular forces in liquid, to know in detail about viscosity and surface tension and its determination

CO-3 A review on the nature of solid state, different crystal systems, analysis of cubic crystals, to have a deep idea on the different types of ionic compounds and to know in detail about the liquid crystals.

CO-4 Describes the interfacial phenomenon of adsorption, explains different types of adsorption and its significance, enumerate the nature of colloidal state, its preparation and properties.

CH5CRT08- PHYSICAL CHEMISTRY-II

CO-1 Gaining a strong foundation in Quantum chemistry

CO- 2 Developing a scientific aptitude to link experiment with theory

CO -3 Familiarisation with fundamentals of various spectroscopic techniques

CO- 4 To equip the learner with basic skills in analysing and interpreting spectrum

CO -5 Understand the basic principles of NMR and ESR spectroscopy

CH5OPT01- CHEMISTRY IN EVERYDAY LIFE

CO-1 To understand the basic concepts of Food Additives, Soaps, Detergents and Cosmetics.

CO-2 To familiarize about Plastics, Paper, Dyes and Drugs.

CO-3 To Learn about Nanomaterials and the interdependence between Chemistry and Agriculture

SEMESTER VI

CH6CRT09-INORGANIC CHEMISTRY

CO-1 To learn in detail about the concepts and applications of coordination Chemistry.

CO-2 To understand the basic concepts of Organometalic Chemistry.

CO-3 To familiarize about Bioinorganic Chemistry.

CO-4 To get brief idea of Boron compounds, Interhalogen and Noble gas Compounds

CH6CRT10- ORGANIC CHEMISTRY –IV

CO -1 To introduce students to the world of natural products, lipids, vitamins, steroids and hormones.

CO -2 To familiarize the concepts of amino acids, peptides, proteins, enzymes and nucleic acids

CO -3 To provide an elementary idea about supramolecular chemistry.

CO -4 To get acquainted with organic photochemistry.

CO- 5 To equip the students to interpret spectra of organic molecules using various spectroscopic tools like UV, IR, NMR and Mass.

CH6CRT11-PHYSICAL CHEMISTRY –III

CO-1 To learn in detail about the concepts and applications of thermodynamics.

CO-2 To understand the basic concepts of Chemical, Ionic and Phase Equilibria

CO-3 To get brief idea of Chemical Kinetics

CH6CRT12- PHYSICAL CHEMISTRY -IV

CO- 1 Develop a critical knowledge of various binary solutions and their distillation behaviour.

CO -2 To get acquainted with Nernst distribution law and its applications

CO -3 To impart a foundation on the concept of chemical potential

CO- 4 Developing scientific temper by gaining an understanding of electrical conductance and electrochemical cells

CO -5 To get introduced to the laws of photochemistry

CO -6 Classifying various molecules into point groups based on group theory

CH6CRP03- QUALITATIVE INORGANIC ANALYSIS

CO- 1 To introduce the systematic way of analyzing inorganic mixtures using semi micro method.

CO- 2 To study the reactions of various radicals with a view to identify and confirm them, from a mixture of two acid and two basic radicals.

CH6CRP04-ORGANIC PREPARATIONS AND LABORATORY TECHNIQUES

CO-1 To master basic laboratory techniques like crystallization, distillation, solvent extraction etc

CO-2 To perform different types of Organic Preparations

CO-3 To separate a component from a mixture of compounds using TLC and column Chromatography

CH6CRP05- PHYSICAL CHEMISTRY PRACTICALS

CO -1 Gain an ability to determine the viscosity of a solution.

CO -2 To develop know-how about the concept of heat of neutralisation

CO- 3 To apply relevance of colligative properties

CO- 4 To find out the concentration of a solution using conductometric and potentiometric titrations

CO- 5 To get well acquainted with using spreadsheet program

CH6CRP06- GRAVIMETRIC ANALYSIS

CO -1 To provide a fundamental idea regarding the application of gravimetry as a tool for quantitative estimation.

COMPLEMENTARY COURSES IN CHEMISTRY

SEMESTER I

CH1CMT01 - BASIC THEORETICAL AND ANALYTICAL CHEMISTRY

CO-1 To have a basic knowledge about the atomic structure and chemical bonding

CO-2 To study the fundamental concepts of chemistry including periodic properties and chemical and ionic equilibrium

CO-3 To develop a deep knowledge about the analytical techniques involved in the laboratory.

CO-4 To understand different types of chromatographic techniques and the principle behind chromatography

SEMESTER II

CH2CMT02 - BASIC ORGANIC CHEMISTRY

CO-1 To study the fundamental concepts of organic chemistry

CO-2 To have deep knowledge about the organic reaction mechanisms

CO-3 To understand about the stereoisomerism and stereochemistry of organic compounds

CO-4 To know in detail about the natural and synthetic polymers, environmental hazards of polymer revolution and recycling of plastics

SEMESTER III

CH3CMT03- PHYSICAL CHEMISTRY – I (For students who have opted Physical Sciences and Geology as Main)

CO-1 To enable the students to get a clear idea about the molecular structure

CO-2 To make students capable of understanding and studying electrical and nuclear properties of molecules

CH3CMT04- INORGANIC AND ORGANIC CHEMISTRY (For students who have opted Life Sciences and Family & community Science as core)

CO- 1 Identifying and familiarising various heterocyclic compounds and their chemical properties.

CO- 2 Developing a critical understanding about the role and application of pesticides, fungicides and germicides

CO -3 Enhancing the fundamental understanding of nucleus and nuclear forces in terms of nuclear chemistry

CO- 4 Appreciating the chemistry of drugs and its pharmacological applications

SEMESTER IV

CH4CMT05- PHYSICAL CHEMISTRY – II (For students who have opted Physical Sciences and Geology as Main)

CO- 1 To promote understanding of the basic facts and concepts in spectroscopy and to develop interest in students to study the structure and properties of matter.

CO-2 To help the students to get a basic idea about spectroscopy

CO-3 To enable the students to study the rules governing chemical reactions and factors influencing them.

CH4CMT06 -ADVANCED BIO-ORGANIC CHEMISTRY (For students who have opted Life Sciences and Family & community Science as core)

CO-1 To understand the basic concepts of Terpenoids, Alkaloids, Lipids, Soaps and Detergents.

CO-2 To familiarize about amino acids, proteins, enzymes and nucleic acids.

CO-3 To learn about carbohydrates, Vitamins, Steroids and Hormones

CH4CMP02- PHYSICAL CHEMISTRY PRACTICALS (For students who have opted Physical Sciences and Geology as Main)

CO-1 To determine viscosity, CST, Transition temperature etc

CO-2 To find the heat of neutralization, kinetics of a reaction

CO-3 To estimate the mass of ion or compound using conductometric and potentiometric titrations

CH4CMP03- ORGANIC CHEMISTRY PRACTICALS (For students who have opted Life Sciences and Family & community Science as core)

CO-1 To detect different functional groups of organic compounds

CO-2 To find the physical constants like melting point and boiling point

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