

B.Sc. Chemistry	
After successful completion of this programme students should be able to-	
Name of the Course	Expected Learning Outcome
Semester I	<ul style="list-style-type: none"> ➤ Solve the conceptual questions using the knowledge gained by studying the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals, and periodicity in atomic radii, ionic radii, ionization energy and electron affinity of elements. ➤ Understand the periodicity in atomic and ionic radii, electronegativity, ionization energy, electron affinity of elements of the periodic table. ➤ Understand the concept of Volumetric Titrations ➤ Understand the fundamental concepts of stereochemistry. ➤ Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution. ➤ Gain knowledge of different reactions that aliphatic and aromatic hydrocarbons can give
Semester II	<ul style="list-style-type: none"> ➤ Understand preparation, properties and reactions of haloalkanes, haloarenes and oxygen containing functional groups. ➤ To propose possible mechanisms for any relevant reaction. ➤ Design newer synthetic routes for various organic compounds ➤ Understand the first law of thermodynamics, concept of State and Path functions, extensive and intensive properties, types of systems ➤ Derive ideal gas law from kinetic theory of gases and explain why the real gases deviate from ideal behaviour. ➤ Explain the properties of liquids especially surface tension and viscosity. ➤ Explain symmetry elements, crystal structure specially NaCl, KCl and CsCl
Semester IV	<ul style="list-style-type: none"> ➤ Understand the terms, ligand, denticity of ligands, chelate, coordination number and use standard rules to name coordination compounds. ➤ Explain the meaning of the terms Δ_o, Δ_t, pairing energy, CFSE, high spin and low spin and how CFSE affects thermodynamic properties like lattice enthalpy and hydration enthalpy. ➤ Explain magnetic properties and colour of complexes on basis of Crystal Field Theory. ➤ Understand basic concept of carbohydrates, dyes and drugs ➤ Learn about the theory of colour and constitution as well as the chemistry of dyeing.

	<ul style="list-style-type: none"> ➤ Can explain the uses of synthetic reagents like LDA, Umpolung, Sulphur Ylide, Woodward and Prevost hydroxylation
Semester V	<ul style="list-style-type: none"> ➤ Understand the twelve principles of green chemistry and will build the basic understanding of toxicity, hazard and risk of chemical substances. ➤ Understand stoichiometric calculations and relate them to green chemistry metrics. They will learn about atom economy and how it is different from percentage yield. ➤ Learn about different reactions of polymers, mechanisms of polymerization and polymerization techniques ➤ Understand how to determine structure of organic compounds on the basis of NMR ➤ Learn about limitations of classical mechanics and solution in terms of quantum mechanics for atomic/molecular systems. ➤ Learn the working of electrochemical cells, galvanic cell, corrosion and happenings in surroundings related to electrochemistry.
Semester VI	<ul style="list-style-type: none"> ➤ Understand the basic principle of soil chemistry ➤ Understand different chromatographic separation techniques ➤ Understand the classification of Organometallic compounds. Preparation, properties and application of Alkyl and Aryls of Al, Hg and Sn ➤ Understand principles of various spectroscopic techniques like Rotational and Vibrational spectroscopy ➤ Understand the various applications of radioactivity, Radiochemical principles in the use of tracers ➤ Gain basic knowledge of photochemistry including Beer – Lamberts, laws of photochemistry: Grothus-Draper law, Stark-Einstein law, Jablonski diagram depicting various processes (nonradiative and radiative) fluorescence, phosphorescence, chemiluminescence, quantum yield etc.
Skill Enhancement Course (SEC)	
Semester V SEC I: Pharmaceutical Chemistry	<ul style="list-style-type: none"> ➤ Gain insight into retro-synthesis approach in relation to drug design and drug discovery. ➤ Learn synthetic pathways of major drug classes. ➤ Understand the fermentation process and production of ethanol, citric acids, antibiotics and some classes of vitamins.

<p>SEC II: Chemistry of Cosmetics& Perfumes</p>	<ul style="list-style-type: none"> ➤ Learn basic of cosmetics, various cosmetic formulation, ingredients and their roles in cosmetic products. ➤ Learn the use of safe, economic and body-friendly cosmetics ➤ Prepare new innovative formulations.
<p>Semester VI</p> <p>SEC-III: Pesticide chemistry</p> <p>SEC-IV: Analytical Clinical Biochemistry</p>	<ul style="list-style-type: none"> ➤ Students will be able to learn about the basic role of pesticide in everyday life, various ingredients and their role in controlling the pest. ➤ Students can also educate the farmers/gardeners to choose the appropriate pesticides for their crop production. ➤ Understand and establish how the structure of biomolecules determines their reactivity and biological uses. ➤ Understand the basic principles of drug-receptor interaction and structure activity relation (SAR). ➤ Gain an insight into concept of heredity through biological processes like replication, transcription and translation. ➤ Demonstrate an understanding of the biochemistry of diseases. ➤ Understand the application of chemistry in biological systems. SEC-8: Green Methods in Chemistry