

Department of Chemistry

Programme-specific Outcomes and Course Outcomes

Chemistry is the science of everyday life – allowing us to explain properties of substances, their structures and the changes they undergo. Consequently, the chemical industry is central to the modern world economy and chemistry graduates have a wide range of employment options open to them in the field of research for human development and oil, gas, energy and also pharmaceutical industries, as well as in consumer products.

- A Comprehensive understanding of the subject giving substantial heftiness to both the core content and techniques used equally to the three main branches of chemistry- Physical, Inorganic, Organic. Chemistry Honours students are able to recognize and apply the principles of atomic and molecular structure to predict chemical properties and chemical reactivity.
- Students are able to employ critical thinking and scientific inquiry in the performance, design, interpretation and documentation of laboratory experiments, at a level suitable to succeed at an entry-level position in chemical industry.
- Analyse quantitative and qualitative data and interpretation ability will be developed.
- Understand theoretical concepts of instruments that are commonly used in most chemistry fields as well as interpret and use data generated in instrumental chemical analyses. Students can access and be enriched with the modern and sophisticated instruments.

Course Outcomes

- Describe Valence Bond Theory, MO Theory and Electronic Displacement of Organic Molecules and their Physical Properties.
- Describe Details study of classification of reactions, intermediates and their mechanistic Pathway.
- To acquaint the young learners with the basic concepts of stereochemistry so that they can use their knowledge to enter into the realm of investigations of more intricate problems dealing with crystals, biomolecules, drugs and polymers.
- To design, carry out, record and analyze the results of chemical experiments like Separation, Identification of Chemical compounds.
- Provide a background necessary in dealing with different types of Physicochemical phenomena through conventional theoretical approaches, statistical or quantum mechanical formulations.
- Introduces students to the structure, symmetry and bonding of atoms, simple molecules and covalent and ionic solids. Aspects of the reactivity of compounds (acid/base chemistry, oxidation and reduction). Provide information regarding understanding of periodic trends, VSEPR, Lewis dot structures, atomic orbitals, and some familiarity with both valence bond theory and molecular orbital theory.
- Some chapters deal with the chemistry and properties of the group elements of the periodic table including transition metals and lanthanides and actinides. Specifically,

the class introduces electron configurations for the elements and oxidation state trends for each group, and important concepts, including the 18 VE rule, bonding and isomerism in coordination compounds, crystal field theory, and electronic properties of ligands. Covered also are metal bonding in clusters, the HSAB concept, chelate effect, and complex stability. Reactions of complexes are analyzed, and the role of transition metal compounds in catalysis is described with examples.