

B.Sc

**Programme Outcome:**

- To understand basic facts and concepts in Polymer Chemistry while retaining the exciting aspects of Polymer Chemistry so as to develop interest in the study of Polymer chemistry as a discipline.
- To develop problem solving skills. To be familiarized with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies. To develop skills in the proper handling of apparatus and chemicals. To be exposed to the different processes used in industries and their applications.
- Explain the general reaction course and reaction mechanism for common polymerizations.
- Describe and compare the polymerization principles.
- Calculate parameters and outcomes of polymerizations.
- Evaluate polymerizations from a green chemistry perspective.
- Practically perform different types of polymerizations.
- Present and evaluate laboratory assignments in writing.

**Programme Specific Outcome:**

- The ability to explain chemical nomenclature, structure, reactivity, and function in their specific field of chemistry. The design and execution of the experiment should demonstrate an understanding of good laboratory and the proper handling of chemical waste streams and also explain how the applications of Polymer Chemistry relates to the real world.

**Course Outcomes:**

| <b>Semester 1</b>                                |  |
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| <b>Course Name</b>                               | <b>Outcomes</b>  |
| Inorganic Chemistry– I                           | To enable the students to learn the principles of modern theory of atomic structure, periodic properties of elements, occurrence and isolation of elements, chemical bonding, nuclear chemistry and environmental chemistry (air, water and soil pollution).   |
| <b>Semester 2</b>                                |  |
| Foundation Course Ii (Methodology & Informatics) | To enable the students to learn about the principles of science and its methods, experimentation and data handling in Science. The course also aims at teaching the evolution of chemistry as a discipline of science, giving an overview of information technology, introducing cheminformatics and analytical chemistry. |

| <b>Semester 3</b>                             |  |
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| Physical Chemistry-I                          | To provide the students with a deep understanding on the principles and application of thermodynamics, chemical kinetics, chemical and ionic equilibria and properties of binary liquid mixtures.  |
| <b>Semester 4</b>                             |  |
| Organic Chemistry-I                           | To introduce the concepts of reaction mechanism, conformational analysis and stereochemistry of simple organic compounds. To impart knowledge about the preparation, reactivity and properties of hydrocarbons and halogen and oxygen containing organic molecules.  |
| Inorganic Qualitative and Volumetric Analysis | To equip the students with skill in qualitative and quantitative chemical analysis of inorganic materials.   |
| <b>Semester 5</b>                             |  |
| Organic Chemistry-Ii                          | To introduce the chemistry of acyclic and cyclic organic compounds containing hetero atoms, organometallic compounds, phytochemicals and secondary metabolites, dyes and drugs.  |
| Physical Chemistry-Ii                         | <b>1.</b> To master the laws that governs the physical and chemical behavior of chemical substances in the gaseous, liquid, solution and solid states. <b>2.</b> To understand how the different phases of matter exist in equilibrium <b>3.</b> To enable the student to understand and appreciate the theories and practice of electrochemistry. |
| Polymer Chemistry-I.                          | <b>1.</b> To introduce the specialized subject of the chemistry of polymers. <b>2.</b> To familiarize the students with the types of polymers, the significance and determination of their molecular mass. <b>3.</b> To understand in detail the mechanisms of the reactions that lead to the formation of polymers.                               |
| Organic Chemistry Experiments.                | To train the students in qualitative and quantitative chemical analysis of organic materials.  |
| Polymer Chemistry Experiments.                | To develop skills for qualitative and quantitative analysis of polymeric materials and preparation of polymers.  |
| Open Course (Chemistry In Every Day Life)     | To make the students aware of the contributions of chemistry in making our life pleasant and comfortable.  |

**Semester 6**

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| Inorganic Chemistry II                         | <b>1.</b> To understand the electronic configuration and general properties of transition metals, lanthanides and actinides. <b>2.</b> To enable the students to learn about the bonding in co-ordination and organometallic compounds. <b>3.</b> To grasp the concepts of symmetry and its applications in inorganic structural chemistry <b>4.</b> To learn about the compounds of non-transition elements, non-aqueous solvents and bioinorganic chemistry. |
| Physical Chemistry III                         | <b>1.</b> To introduce the concepts of quantum mechanics. <b>2.</b> To familiarize the students with the theory, instrumentation and application, at an introductory level, of the various spectroscopic methods in chemistry. <b>3.</b> To learn the chemical behavior of substance in the colloidal state, the physicochemical aspects of photochemical, catalytic and adsorption phenomena.   |
| Polymer Chemistry II                           | <b>1.</b> To introduce different levels of polymer structure and the critical importance of Tg and Tm. <b>2.</b> To provide an overview of polymer reactions and reactivity of polymers. <b>3.</b> To understand factors that influences the degradation of polymers. <b>4.</b> To learn about the properties of polymers in solution and biopolymers.   |
| Chemistry Lab (Gravimetry)                     | To equip the students with skill in the chemical analysis.   |
| Chemistry Lab (Physical Chemistry Experiments) | To impart better understanding of the theoretical principles of physical chemistry that the student has learned through experimentation.   |
| Advanced Polymer Chemistry                     | <b>1.</b> To introduce processing and technical aspects of polymers. <b>2.</b> To learn about polymeric materials such as engineering plastics, elastomers and fibres and to understand the characterization of polymers. <b>3.</b> To make the students familiar with the properties of macromolecular solutions.   |
| Project and Factory Visit                      | To kindle the research aptitude, provide research skills and inculcate a spirit of enquiry among the students.   |