

B.Sc. CHEMISTRY

| Sl No: | Semester | Course Name | Nature of the course | Course Code | Course Outcome |
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| 1 | 1 st sem | Theoretical and Inorganic Chemistry-1 | Core | CHE1BO1 | 1. To apply the methods of research project. 2. To analyse the characteristics of different elements. 3. To differentiate between different acid-base concepts. 4. To analyse the stability of different nuclei. 5. To summarize the principles behind volumetry. |
| | | General Chemistry | Complementary | CHE1CO1 | 1. To apply the theories of quantitative and qualitative analysis. 2. To describe the theories of chemical bonding. 3. To appreciate the uses of radioactive isotopes. 4. To summarize the importance of metals in biological systems |
| 2 | 2 nd sem | Theoretical and Inorganic Chemistry-II | Core | CHE2BO2 | 1. To recognize the importance and the impact of quantum revolution in science. 2. To recognize that chemical bonding is the mixing of wave functions of two combining atoms. 3. To recognize the concept of hybridisation as linear combination of orbitals of same atom. 4. To inculcate the atomic/molecular level philosophy in the mind. |
| | | Physical Chemistry | Complementary | CHE2CO2 | 1. To apply the concept of thermodynamic properties to explain the |

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| | | | | | <p>spontaneity of a chemical reaction.</p> <p>2. To describe the properties of solid, liquid gaseous state and solutions.</p> <p>3. To analyse the basic aspects of electrochemistry.</p> |
| 3 | 3 rd sem | Physical Chemistry-I | Core | CHE3BO3 | <p>1. To apply the basic properties of gaseous state to thermodynamic systems.</p> <p>2. To classify and study different thermodynamic processes and evaluate the changes in thermodynamic quantities for a spontaneous process.</p> <p>3. To familiarize with the basic principles of statistical thermodynamics.</p> <p>4. To apply symmetry operations to categorize different molecules.</p> |
| | | Organic Chemistry | Complementary | CHE3CO3 | <p>1. To summarize the basic aspects involved in reaction intermediates.</p> <p>2. To appreciate the importance of optical activity and chirality.</p> <p>3. To appreciate the importance of functional groups and aromatic stability.</p> <p>4. To summarize the basic structure and importance of nucleic acids, carbohydrates, alkaloids and Terpenes.</p> |
| 4 | 4 th sem | Organic Chemistry-I | Core | CHE4BO4 | <p>1. To apply the concepts of stereochemistry to different compounds.</p> |

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| | | | | | <p>2. To summarize the basic aspects of reaction mechanism.</p> <p>3. To analyse the mechanism of a chemical reaction.</p> <p>4. To analyse the stability of different aromatic systems.</p> |
| | | Inorganic Chemistry Practical-I | Core Practical | CHE4BO5(P) | <p>1. To enable the students to develop skills in quantitative analysis and preparing inorganic complexes.</p> <p>2. To classify and perform different volumetric titration methods.</p> <p>3. To apply appropriate techniques of volumetric quantitative analysis in estimations.</p> |
| | | Physical and applied Chemistry | Complementary | CHE4CO4 | <p>1. To discuss the basic concepts behind colloidal state and Nano Chemistry.</p> <p>2. To appreciate the importance of green approach in chemistry.</p> <p>3. To appreciate the importance of different separation methods and spectral techniques.</p> <p>4. To apply the principles of chemistry in daily life.</p> |
| | | Chemistry Practical | Complementary Practical | CHE4CO5(P) | <p>1. To apply the principles of solubility product, ionic product, common-ion effect for the intergroup separation and analysis of cation mixture.</p> <p>2. To classify and perform different volumetric titration methods.</p> |

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| 5 | 5 th sem | Inorganic Chemistry-III | Core | CHE5BO6 | <ol style="list-style-type: none"> 1. To differentiate the principles behind qualitative and quantitative analysis. 2. To summarize the basic processes of metallurgy and to analyse the merits of different alloys. 3. To compare the applications of different inorganic polymers. 4. To analyse different polluting agents. 5. To apply the principles of solid waste management. |
| | | Organic Chemistry-II | Core | CHE5BO7 | <ol style="list-style-type: none"> 1. To evaluate the difference between alcohols and phenols. 2. To compare the importance of ethers and epoxides. 3. To apply organometallic compounds in the preparation of different functional groups. 4. To apply different reagents for the interconversion of aldehydes, carboxylic acids and acid derivatives. 5. To apply active methylene compounds in organic preparations |
| | | Physical Chemistry-II | Core | CHE5BO8 | <ol style="list-style-type: none"> 1. To apply the concepts of kinetics, catalysis and photochemistry to various chemical and physical processes. 2. To differentiate the different spectroscopic methods of analysis. |

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| | | | | | <p>3. To characterize different molecules using spectral methods.</p> <p>4. To gain an insight about various phase transitions and its applications.</p> |
| | | Environmental Chemistry | Open | CHE5DO1 | <p>1. To summarize the causes and effects of air pollution and water pollution.</p> <p>2. To describe water quality parameters.</p> <p>3. To explain soil, noise, thermal and radioactive pollution and their effects.</p> <p>4. To summarize the basics of green chemistry.</p> |
| 6 | 6 th sem | Inorganic Chemistry-IV | Core | CHE6BO9 | <p>1. To classify and summarize the principles behind different instrumental methods.</p> <p>2. To distinguish between lanthanides and actinides.</p> <p>3. To appreciate the importance of crystal field theory in explaining the bonding of coordination compounds.</p> <p>4. To recognize the importance of metals in living systems.</p> |
| | | Organic Chemistry-III | Core | CHE6B10 | <p>1. To generate the structure of simple organic compounds using spectral techniques.</p> <p>2. To summarize the basic structure and tests for carbohydrates.</p> <p>3. To interpret the basic components of DNA to its importance.</p> <p>4. To recognize the basic structure and applications</p> |

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| | | | | | of alkaloids and Terpenes. 5. To classify the different Pericyclic reactions. |
| | | Physical Chemistry-III | Core | CHE6B11 | 1. To classify and analyse the basic aspects of electrochemistry. 2. To apply the principles of colligative properties to find the physical properties of compounds. 3. To attribute the properties of solids to the geometrical properties and chemical compositions. 4. To analyse the properties of ionic equilibria. |
| | | Advanced and Applied Chemistry | Core | CHE6B12 | 1. To explain the importance of Nano materials. 2. To appreciate the importance of green approach in chemistry. 3. To apply the different methods of computational chemistry to design molecules. 4. To summarize the role of chemistry in human happiness index and life expectancy. |
| | | Polymer Chemistry | Elective | CHE6B13(E2) | 1. To summarize the various methods for the classification of polymers and types of polymerization methods. 2. To explain the important characteristics of polymers such as average molecular weight, glass transition temperature, viscoelasticity and degradation. |

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| | | | | | <p>3. To appreciate the importance of processing techniques.</p> <p>4. To characterise different commercial polymers.</p> |
| | | Physical Chemistry Practical | Core Practical | CHE6B14(P) | <p>1. To equip the students to develop analytical skills in determining physical properties.</p> <p>2. To generate skill in setting up an experimental method to determine the physical properties.</p> <p>3. To apply the principles of refractometry, Conductometry, potentiometry for quantitative analysis.</p> <p>4. To apply the principles of chemical kinetics to study the rates of chemical reactions.</p> |
| | | Organic Chemistry Practical | Core Practical | CHE6B15(P) | <p>1. To equip the students to develop analytical skills in organic qualitative analysis.</p> <p>2. To generate talent in organic preparations to ensure maximum yield.</p> <p>3. To apply the concepts of melting or boiling points to check the purity of compounds.</p> <p>4. To analyse and characterize simple organic functional groups.</p> |
| | | Inorganic Chemistry Practical-II | Core Practical | CHE6B16(P) | <p>1. To equip the students to develop analytical skills in inorganic qualitative analysis.</p> <p>2. To apply the principles of gravimetry for quantitative analysis.</p> |

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| | | | | | 3. To apply the principles of Colorimetry for quantitative analysis. |
| | | Inorganic Chemistry Practical-III | Core Practical | CHE6B17(P) | <ol style="list-style-type: none"> 1. To equip the students to develop analytical skills in inorganic qualitative analysis. 2. To apply the principles of solubility product and common ion effect in qualitative analysis. 3. To analyse systematically mixtures containing two cations and two anions. |
| | | Project Work | Core | CHE6B18(Pr) | <ol style="list-style-type: none"> 1. To recall the scientific methods of research project. 2. To apply the scientific methods in life situations. 3. To analyse scientific problems systematically. |