

## **MSc. CHEMISTRY PROGRAMME OUTCOME**

At the completion of the programme

1. The student will be able to work in pure, interdisciplinary and multidisciplinary areas of chemical sciences.
2. Understand global level research opportunities to pursue Ph.D programme.
3. Develop a sound knowledge of fundamentals and a familiarity with current progress in the most active and important areas of chemistry.

## **MSc CHEMISTRY PROGRAMME SPECIFIC OUTCOME**

1. Gains complete knowledge about all fundamental aspects of all the elements of chemistry.
2. Understands the background of organic reaction mechanisms, complex chemical structures, and instrumental method of chemical analysis, molecular rearrangements and separation techniques.
3. Appreciates the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of complexes using theories and instruments.
4. Gathers attention about the physical aspects of atomic structure, dual behavior, reaction pathways with respect to time, various energy transformations, molecular assembly in nanolevel, significance of electrochemistry, molecular segregation using their symmetry.
5. Learns about the potential uses of analytical and industrial chemistry, medicinal chemistry and green chemistry.
6. Carry out experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi micro analysis, preparation, conductometric and potentiometric analysis.

## **COURSE OUTCOME**

### **QUANTUM MECHANICS AND COMPUTATIONAL CHEMISTRY-CH1C01**

- Learns the fundamentals of quantum mechanics and computational chemistry
- Gains good idea about quantum mechanical postulates and its applications.
- Training on computational chemistry

### **ELEMENTARY INORGANIC CHEMISTRY-CH1C02**

- Understands the concepts of acids and bases.
- Visualizes the energy behind the nuclear reaction. .
- Enlights the knowledge about main group elements, transition elements and inner transition compounds.
- Learns basics of nanochemistry.

### **STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS-CH1C03 .**

- Appreciates the fundamentals of aromaticity in organic chemistry .
- Acquires the 3-D aspects of organic molecules.
- Analyses the cruciality of the stereochemical process Perceives the concept of conformational analysis.

### **THERMODYNAMICS, KINETICS AND CATALYSIS -CH1C04**

- Learns the classical status of thermodynamics
- Appreciates the fundamentals of molecular thermodynamics
- Understands chemical kinetics
- Estimates the basis of chemical surfaces

### **GROUP THEORY AND CHEMICAL BONDING -CH2C05**

- Learns the concept of group theory and molecular symmetry.
- Learns to predict the translational and rotational motions of molecules using point group and character table
- Applies the wave mechanics for determining atom structure .
- Visualizes the macro molecular structure

### **COORDINATION CHEMISTRY -CH2C06**

- Learns the structure and properties of coordination compounds
- Analyses the reaction pathways of complex formation
- Appreciates the vibrant role of catalysts in chemical reaction

#### **REACTION MECHANISM IN ORGANIC CHEMISTRY-CH2C07**

- Visualizes the aromatic electrophilic substitution
- Learns the fundamentals of mechanism reaction mechanisms
- Understands the mechanism of nucleophilic substitution and elimination reaction.

#### **ELECTROCHEMISTRY, SOLID STATE CHEMISTRY AND STATISTICAL THERMODYNAMICS-CH2C08**

- Understands the various theories of electrolytic conductance
- Recognizes the dynamics of electrode reaction
- Learns the importance of chemical reaction against time
- Learns the basis of solid state chemistry.
- Gains knowledge about statistical thermodynamics

#### **MOLECULAR SPECTROSCOPY-CH3C09**

- Analyses the chemical structure using UV, IR and mass spectra.
- Determines the chemical environment H and ac NMR spectra

#### **ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY-CH3C10**

- Validates the role of bioinorganic chemistry in every day action
- Gains knowledge about organometallic compounds and metal clusters.

#### **REAGENTS AND TRANSFORMATIONS IN ORGANIC CHEMISTRY – CH3C11**

- Understands basis of redox reaction
- Gains the potential of organic reactants
- Appreciates the various steps involved in the molecular rearrangements
- Gains the potential about complex vitamin and nucleic acid structure
- Learns the fundamentals of supramolecular chemistry.

#### **SYNTHETIC ORGANIC CHEMISTRY-CH3E01**

- Gains the potential of organic reactants

- Understands the basis of redox reaction
- Appreciates the various steps involved in the molecular rearrangements

#### **INSTRUMENTAL METHODS OF ANALYSIS -CH4C12**

- Analysis the variations of practical errors
- Gains the potential about different precipitation processes
- Determines the procedure for electro analytical techniques
- Determines the procedure for thermo analytical techniques
- Validates the strength of spectro analytical technique

#### **NATURAL PRODUCTS AND POLYMERS-CH4E06**

- Learns the chemical background of individual polymers
- Determines the various uses of polymers process
- Understands the classification of polymers
- Analyses the different types of polymerization process
- Visualizes the methods of polymer degradation

#### **ORGANOMETALLIC CHEMISTRY – CH4E08**

- Learns about the organometallic compounds
- Application of spectroscopy to organometallic compounds
- Analyses the applications of organometallic compounds in organic synthesis
- Gains knowledge about organometallic polymers.

#### **INORGANIC PRACTICAL-1&II**

- Determines as the procedure for semi micro analysis of Inorganic salt mixture
- Understanding the procedure for semi micro qualitative analysis
- Appreciates the procedure for inorganic analysis.
- Estimate the accurate analytical procedure of analysis.
- Learns the steps involved in the complex formation process.

#### **ORGANIC PRACTICAL-1&11**

- Learns principle of organic estimation.
- Gains the procedure for organic separation and derivation

- Understands the method of organic preparation
- Develops the various routes for recrystallization
- Identifies the way for identification of components

### **PHYSICAL CHEMISTRY PRACTICAL- 1811**

- Gains the procedure for conductometric determination.
- Learns holistic method of surface adsorption.
- Experiments the kinetics of chemical reaction.
- Appreciates the importance of potentiometric methods.
- Understands the sensitivity of pH metric titration