

M.Sc. ORGANIC CHEMISTRY (2019 PATTERN)

PROGRAMME OUTCOMES:

After completing M.Sc. Chemistry programme, students will be able to:

Knowledge Outcomes:

PO1: Demonstrate and apply the fundamental knowledge of the basic principles in various fields of Chemistry

PO2: Create awareness and sense of responsibilities towards environment and apply Knowledge to solve the issues related to Environmental pollution.

PO3: Apply knowledge to build up small scale industry for developing endogenous product.

PO4: Apply various aspects of chemistry in natural products isolations, Pharmaceuticals, dyes, textiles, polymers, petroleum products, forensic etc. and also to Develop interdisciplinary approach of the subject.

Skill Outcomes: It would help students to

PO4: collaborate effectively on team-oriented projects in the field of Chemistry or other Related fields.

PO5: communicate scientific information in a clear and concise manner both orally and in writing.

PO6: inculcate logical thinking to address a problem and become result oriented with a positive attitude.

PO7: Explain environmental pollution issues and the remedies thereof.

PO8: apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry.

Generic Outcomes:

PO9: Have developed their critical reasoning, judgment and communication skills.

PO10: Augment the recent developments in the field of green and eco-friendly reactions, pharmaceutical, Bioinorganic Chemistry and relevant fields of research and development.

PO11: Enhance the scientific temper among the students so as to develop a research culture
And implementation of the policies to tackle the burning issues at global and local
level.

COURSE OUTCOMES:

M.Sc. PART I (ORGANIC CHEMISTRY) (2019 PATTERN)

Course: CCTP- 1: CHP - 110 Semester I (4 Credits)

Course Name: Fundamentals of Physical Chemistry I

After successfully completing this course, students will be able to:

CO1: Statement and mathematical equation of laws of thermodynamics

CO2: Basic concepts of factor affecting on reaction rates

CO3: Derivations of reaction kinetics of elementary and complex reactions

CO4: Enzyme kinetics with catalysis and inhibition

CO5: Explosion limits in explosive reaction

CO6: Change of order of gaseous reaction with respect to pressure

CO7: Problem solving using scientific calculator

Course: CCTP – 2 : CHI – 130 Semester I (4 Credits)

Course Name: Molecular Symmetry and Chemistry of p-block elements

After successfully completing this course, students will be able to:

CO1: Able to visualize molecule in 3-D, understand the concept of symmetry elements and symmetry operations.

CO2: know the point groups of molecules and understand symmetry considerations for optical activity and dipole moment.

CO3: Understand the group multiplication table, character table and representations of group.

CO4: Apply the projection operator for constructing SALCs and also to construct the molecular orbitals using various symmetry operations and their representations.

CO5: correlate application of symmetry to spectroscopy and find IR active modes of vibration.

CO6: Understand the detail chemistry of s- and p- block elements w.r.t. their compounds, reactions and applications.

CO7: learn the advance chemistry of boranes, fullerenes, zeolites, carbon nanotubes, Polymers, etc.

CO8: Understand the organometallic chemistry of some important elements of s- and p-block.

Course: CCTP – 3 : CHO – 150 Semester I (4 Credits)

Course Name: Basic Organic Chemistry

After successfully completing this course, students will be able to:

CO1: understand fundamental aspects of organic chemistry, learn the concept of aromaticity and its types.

CO2: to study heterocyclic compounds w.r.t. their structure, synthesis and reactions.

CO3: understand concepts of stereochemistry and will be able to stereochemical aspects in organic chemistry.

CO4: To study structure, formation, stability and related name reaction of intermediates like carbocation, carbanion, free radical, carbenes and nitrenes; recognise neighbouring group participation.

CO5: To study rearrangement reaction with specific mechanism and migratory aptitude of different groups.

CO6: To study Ylides and their reactions.

CO7: To understand the basis of redox reactions; reagents and mechanism for selective oxidation/reduction reactions of organic compounds.

Course: CCTP – 4: CHP – 210 Semester II (4 Credits)

Course Name: Fundamentals of Physical Chemistry II

After successfully completing this course, students will be able to:

CO1: Concept of microwave, IR Raman , NMR, Mossebaur spectroscopy with spectral analysis

CO2: Problem solving

CO3: Understanding the applications of radioactivity in structure determination medicine, industry etc

CO4: Nuclear decay kinetics and its applications

Course: CCTP – 5 : CHI – 230 Semester II (4 Credits)

Course Name: Coordination and Bioinorganic Chemistry

After successfully completing this course, students will be able to:

CO1: To find out microstates, term symbols, Hund's rules and construct microstate table for different configurations and understand interelectronic repulsion.

CO2: Know the concept of weak and strong ligand fields and the splitting of free ion terms in these ligand fields.

CO3: To interpret electronic spectra for the Oh and Td complexes using Orgel diagram.

CO4: Understand the phenomenon of magnetism, magnetic moment and its temperature dependence and the quenching of orbital angular momentum.

CO5: Role of metal in metalloenzymes and metalloproteins; importance of metal ions and metal transport (Active and Passive).

CO6 : Correlation of coordination theory with metal complexes with biological ligands.

CO7 : role of Ca, Fe, Mn and Mg in metalloproteins.

Course: CCTP – 6 : CHO – 250 Semester II (4 Credits)

Course Name: Organic Chemistry II

After successfully completing this course, students will be able to:

CO1: Understand MOT and will be able to extend this in predicting reaction mechanism and stereochemistry of electrocyclic reactions.

CO2: The concepts in free radical reactions, mechanism and the stereochemical outcomes.

CO3: The basic principle of spectroscopic methods and their applications in structure elucidation of organic compounds using given spectroscopic data or spectra.

Course: CBOP – 1: CHG – 190 : : Semester - I (4 Credits)

Course Name: General Chemistry – I

Section I : Theory Course

Elective Option C: Introduction of Chemical Biology – I

After successfully completing this course, students will be able to:

CO1: Know the fundamental concepts in chemical biology.

CO2: Impart new ideas in the chemistry of carbohydrates, proteins, nucleic acids, etc.

CO3: To describe the chemical basis for replication, transcription, translation and how each of these central processes can be expanded to include new chemical matter.

Section II : Practical Course

Elective Option A: Inorganic Material Analysis, Synthesis and Applications

After successfully completing this course, students will be able to:

CO1: prepare the exact solutions for quantitative analysis.

CO2: Apply the knowledge of quantitative analysis for the determination of metals from ores/alloys.

CO3: Understand the synthesis and applications of solid state or nano materials by various techniques such as precursor, sol-gel or co-precipitation methods.

CO4: Learn various characterization techniques like absorption spectroscopy, XRD, SEM, TEM, etc.

Course: CBOP – 2: CHG – 290 : : Semester - II (4 Credits)

Course Name: General Chemistry – II

Section I : Theory Course

Elective Option C: Introduction of Chemical Biology – II

After successfully completing this course, students will be able to:

CO1: Explore new areas of research both in chemistry and new interdisciplinary areas of science and technology.

CO2: Understand the methods in chemistry used to solve problems in molecular and cell biology.

CO3: Describe the metabolism of biomolecules, biochemical techniques like chromatography, dialysis, electrophoresis, etc.

Course: CCPP – 1: CHP – 107 : Practical Course – I : Semester - I

Course Name: Basic Practical Chemistry - I

Section I : Physical Chemistry Practical

After successfully completing this course, students will be able to:

CO1: Performance of the experiment with proper safety measures

CO2: Preparation of solutions

CO3: Correlate the theory of kinetics with the experiments

CO4: Understanding the concept of molecular size

CO5: Understanding the treatment of data using statistical methods

Section II : Organic Chemistry Practical

After successfully completing this course, students will be able to:

CO1: understand different purification techniques in organic chemistry like recrystallization, distillation, steam distillation and extraction.

CO2: get awareness of safety techniques and handling of chemicals.

CO3: understand and write mechanism of reactions and their applications.

Course : CCPP – 2 : CHP – 227 : Practical Course –II : Semester - II

Course Name: Basic Practical Chemistry - II

Section I : Inorganic Chemistry Practical

After successfully completing this course, students will be able to:

CO1: synthesize Inorganic complexes and also find their purity.

CO2: Understand Ion-exchange chromatography for separation of metal ions.

CO3: Understand the principle and working of different instruments like colourimeter, conductometer, spectrophotometer, etc.

Section II : Organic Chemistry Practical

After successfully completing this course, students will be able to:

CO1 : understand how to carry out different types of reactions and their workup methods.

CO2: become aware of green chemistry and role of green chemistry in pollution reduction.

CO3: apply theoretical knowledge in practical for various conversions.

CBOP-2 Physical Chemistry practical

Students should be able to

CO1: Take the safety measures while working in the chemistry laboratory.

CO2: Prepare the solutions of appropriate concentration.

CO3: Performance of titration to get the accurate end point

CO4: Use the pH meter and potentiometer, conductivity meter and colorimeter

CO5: Understanding of crystallization, distillation process

CO6: Basic techniques of plotting of graphs
