

Department of Chemistry

Syllabus 2023 onwards

M.Sc. Chemistry-Course Outcomes

SEMESTER – I

P23CHT101 – ORGANIC CHEMISTRY - I

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able

CLO1: To recall the basic principles of organic chemistry.

CLO2: To understand the formation and detection of reaction intermediates of organic reactions.

CLO3: To predict the reaction mechanism of organic reactions and stereochemistry of organic compounds.

CLO4: To apply the principles of kinetic and non-kinetic methods to determine the mechanism of reactions.

CLO5: To design and synthesize new organic compounds by correlating the stereochemistry of organic compounds.

P23CHT102 – INORGANIC CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able to

CO1: Predict the geometry of main group compounds and clusters.

CO2: Explain about the packing of ions in crystals and apply the radius ratio rule to predict the coordination number of cations.

CO3: Understand the various types of ionic crystal systems and analyze their structural features.

CO4: Explain the crystal growth methods.

CO5: To understand the principles of diffraction techniques and microscopic techniques.

P23CHP101 – ORGANIC CHEMISTRY PRACTICAL

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To recall the basic principles of organic separation, qualitative analysis and preparation.

CO2: To explain the method of separation and analysis of separated organic mixtures and convert them as derivatives by suitable preparation method.

CO3: To determine the characteristics of separation of organic compounds by various chemical reactions.

CO4: To develop strategies to separate, analyze and prepare organic compounds.

CO5: To formulate a method of separation, analysis of organic mixtures and design suitable procedure for organic preparations.

P23CHE11A – PHARMACEUTICAL CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To identify the suitable drugs for various diseases.

CO2: To apply the principles of various drug action and drug design.

CO3: To acquire the knowledge on product development based on SAR.

CO4: To apply the knowledge on applications of computers in chemistry.

CO5: To synthesize new drugs after understanding the concepts SAR.

P23CHE11B – NANO MATERIALS AND NANO TECHNOLOGY

CO1: To explain methods of fabricating nanostructures.

CO2: To relate the unique properties of nanomaterials to reduce dimensionality of the material.

CO3: To describe tools for properties of nanostructures.

CO4: To discuss applications of nanomaterials.

CO5: To understand the health and safety related to nanomaterial.

SEMESTER – II

P23CHT203 – ORGANIC CHEMISTRY - II

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To recall the basic principles of aromaticity of organic and heterocyclic compounds.

CO2: To understand the mechanism of various types of organic reactions.

CO3: To predict the suitable reagents for the conversion of selective organic compounds.

CO4: To correlate the principles of substitution, elimination, and addition reactions.

CO5: To design new routes to synthesis organic compounds.

P23CHT204 – PHYSICAL CHEMISTRY - I

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To explain the classical and statistical concepts of thermodynamics.

CO2: To compare and correlate the thermodynamic concepts to study the kinetics of chemical reactions.

CO3: To discuss the various thermodynamic and kinetic determination.

CO4: To evaluate the thermodynamic methods for real gases and mixtures.

CO5: To compare the theories of reactions rates and fast reactions.

P23CHP202 – INORGANIC CHEMISTRY PRACTICAL

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To identify the anions and cations present in a mixture of salts.

CO2: To apply the principles of semi micro qualitative analysis to categorize acid radicals and basic radicals.

CO3: To acquire the qualitative analytical skills by selecting suitable confirmatory tests and spot tests.

CO4: To choose the appropriate chemical reagents for the detection of anions and cations.

CO5: To synthesize coordination compounds in good quality.

P23CHE22A – MEDICINAL CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able to:

- CO1:** Predict a drug's properties based on its structure.
- CO2:** Describe the factors that affect its absorption, distribution, metabolism, and excretion, and hence the considerations to be made in drug design.
- CO3:** Explain the relationship between drug's chemical structure and its therapeutic properties.
- CO4:** Explain different theories of drug actions at molecular level.
- CO5:** Identify different targets for the development of new drugs for the treatment of infectious and GIT.

P23CHE22B – MATERIAL SCIENCE

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able to:

- CO1:** To understand and recall the synthesis and characteristics of crystal structures, semiconductors, magnets, nano materials and renewable energy materials.
- CO2:** To integrate and assess the structure of different materials and their properties.
- CO3:** To analyse and identify new materials for energy applications.
- CO4:** To explain the importance of crystal structures, piezoelectric and pyro electric materials, nano materials, hard and soft magnets, superconductors, solar cells, electrodes, LED uses, structures and synthesis.
- CO5:** To design and develop new materials with improved property for energy applications.

P23CHNM1A – CHEMISTRY IN EVERYDAY LIFE

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: Appreciate the central role of chemistry in our society (K5)

CO2: Comprehend the role of chemicals in Food & Nutrition (K1)

CO3: Realize the role of chemistry in food production.(K4)

CO4: Understand and analyze the role of chemistry in petrochemical, polymer, and cosmetic Industry (K4)

P23CHNM1B – AGRICULTURAL CHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will:

CO1: Have Acquired knowledge on the chemical composition of soil (K1)

CO2: Be able to illustrate the chemistry behind fertilizers and pesticides (K4)

CO3: Be able to appreciate the chemistry behind agricultural methods (K5)

CO4: Be able to find and suggest suitable methods to promote agriculture.(K6)

SEMESTER – III

P23CHT305 – ORGANIC CHEMISTRY - III

Course Outcomes	<ol style="list-style-type: none">1. Understand the basic concepts of photochemistry and various organic photochemical reactions2. Understand pericyclic reactions3. Apply NMR, IR, MS, UV-Vis spectroscopic techniques in solving structure of organic molecules and in determination of their stereochemistry.
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P23CHT306 – INORGANIC CHEMISTRY - II

Course Outcomes	<p>On learning the course, the students will be able to</p> <ol style="list-style-type: none">1. Identify the bonding, structure and reactivity of selected coordination complexes2. Interpret their electronic spectra and magnetic properties.3. Utilize the principles of transition metal coordination complexes in understanding functions of biological systems.4. Understand the bonding , structure and applications of organometallic compounds
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P23CHT307 – PHYSICAL CHEMISTRY - II

Course Outcomes	<p>On learning the course, the students will be able to</p> <ol style="list-style-type: none">1. Solve the model problems in quantum mechanics and analyze the basis behind the postulatory method of quantum mechanics2. Apply time independent perturbation theory to complex problems of molecular energy levels3. Appreciate and apply the principles of green chemistry and polymer chemistry4. Understand and appreciate the importance of the reactions in surface and catalysis
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P23CHP303 – PHYSICAL CHEMISTRY PRACTICAL

Course Outcomes	On learning the course, the students will be able to <ul style="list-style-type: none">• Explain the principle behind the experiments• Plan and Perform experiments• Interpret experimental results• Perform estimation through conductometry and potentiometry
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P23CHE33A – BIOMOLECULES AND HETEROCYCLIC COMPOUNDS

Course Learning Outcomes (for Mapping with Pos and PSOs)	CO1:To understand the basic concepts of biomolecules and natural products. CO2:To integrate and assess the different methods of preparation of structurally different biomolecules and natural products.. CO3:To illustrate the applications of biomolecules and their functions inn the metabolism of living organism. CO4:To analyse and rationalize the structure and synthesis of heterocyclic compounds. CO5:To develop structure of biologically important heterocyclic compounds by different methods.
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P23CHE33B – ENVIRONMENTAL CHEMISTRY AND GREEN CHEMISTRY

Course Outcomes	On learning the course, the students will be able to <ol style="list-style-type: none">1. Identify environmental problems related to pollution2. Identify and utilize eco-friendly methods to protect environment3. Understand and apply green chemical methods4. Solve the problems related to environmental pollution
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P23CHS2A – NME-CLINICAL CHEMISTRY

Course outcomes	Students will be able to To understand the basics of human organ functions and to impart knowledge on clinical biochemistry and laboratory practices. To describe the basic anatomy of human body To interpret laboratory results of blood and urine samples To Measure total cholesterol, serum LDL and blood glucose level
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P23CHS2B – NME-CHEMISTRY IN FOOD PRESERVATION

Course outcomes	On completion of this course, the students will be able to 1. Explain the various methods of Food Preservation 2. Appreciate the importance of traditional methods of Food Preservation. 3. Analyze the importance of using safe preservatives. 4. Explain the methods of fruits and vegetables processing.
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SEMESTER – IV

P23CHT403 – INORGANIC CHEMISTRY - III

Course Outcomes	On learning the course, the students will be able to <ol style="list-style-type: none">1. Analyze inorganic compounds using various spectroscopic techniques.2. Understand the principles and applications of nuclear reactions3. Familiarize the important inorganic photochemical reactions.4. Apply the knowledge gained in the above concepts.
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P23CHT409 – PHYSICAL CHEMISTRY - III

Course Outcomes	On learning the course, the students will be able to <ol style="list-style-type: none">1. Determine the symmetry operations of any small and medium-sized molecule and apply point group theory to the study of hybridization and spectroscopy.2. Have a sound knowledge of the theories behind various spectroscopic techniques3. Apply the concepts of statistical thermodynamics for the study of equilibrium reactions.4. Understand to apply the concepts of statistical thermodynamics for the study of reaction rates.
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P23CHE44A – CHEMISTRY OF NATURAL PRODUCTS AND BIO INORGANIC CHEMISTRY

Course Outcomes	On learning the course, the students will be able to <ol style="list-style-type: none">1. Understand the structure of organic natural products.2. Identify the structures of metalloproteins and metalloenzymes.3. Appreciate the importance of natural products and bio-inorganic compounds.4. Know and appreciate the importance of chemistry of nature.
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P23CHE44B – PHARMOCOGNOSY AND PHYTOCHEMISTRY

Course Learning Outcomes (for Mapping with POs and PSOs)

Students will be able:

CO1: To recall the sources of natural medicines and analysis of crude drugs.

CO2: To understand the methods of evaluation based on various parameters.

CO3: To analyze the isolated drugs

CO4: To apply various techniques to discover new alternative medicines.

CO5: To evaluate the isolated drugs for various pharmacological activities

P23CH4PRO – PROJECT WITH VIVA

Course Outline	<ol style="list-style-type: none">1. Analyze the existing problems for which research can provide solutions and select the problem for research2. Know the various chemical publishers, journals and perform literature survey3. Synthesize new chemical compounds through various methods4. Characterize the compounds using various analytical and spectroscopical studies.
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P23CHS32 – CHEMISTRY FOR ADVANCED RESEARCH STUDIES

Course Outcomes	<p>On learning the course, the students will be able to</p> <ol style="list-style-type: none">1. Understand the formation and detection of reaction intermediates of organic reactions.2. Identify the bonding and structure of coordination complexes.3. Appreciate the importance of crystallography4. Correlate the structure and spectra of molecules4. Appreciate the importance of nanodevices
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