Course outcomes of

M. Sc Chemistry - Semester I

Paper –I

CH101-CO1

Understand the concept of symmetry (operation & elements) & molecular point group. Able to classify molecules based on point group.

CH101-CO2

Able to compare the splitting pattern in different types of geometries (Oh, Td, distorted Oh, TBP, Linear etc) & calculate crystal field stabilization energy, magnetic behaviour of different complexes.

CH101-CO3

Have an idea about classification of metal complexes, stability constant & relationship between them.

CH101-CO4

Know the factors influencing on stability constant &methods for determining it.

CH101-CO5

Able to define the term (macro cyclic effect, cryptate effect & chelate effect).

CH101-CO6

Acquire knowledge about CO, NO& N_2 as ligands. Able to draw molecular orbital structures of it & differentiation of bonding modes of it. Have an idea about chemical nitrogen fixation.

Course outcomes of

M. Sc Chemistry - Semester I

Paper –II

CH102-CO1

Understand the Molecular Representations and Symmetry Elements of Organic Molecules

CH102-CO2

Acquire knowledge about the Racemisation and Resolution Techniques

CH102-CO3

Determine the conformations of acyclic compounds and the factors affecting the stability and reactivity of conformations

CH102-CO4

Know about the structure and synthesis of Natural products

CH102-CO5

Judge the methods for the determination of organic reaction mechanism

CH102-CO6

Explain the nomenclature , synthesis and reactivity of Heterocyclic compounds

CH102-CO7

Predict the Chirality of the compounds

Course outcomes of

M. Sc Chemistry - Semester I

Paper –III

CH103 – CO1

Understand the concept of entropy, 3rd law of Thermodynamics and evaluation of absolute entropy. Know about the partial molar properties and significance of chemical potential

CH103- CO2

Determine the condition for material equilibrium, phase equilibrium and equilibrium in closed system. Derive Gibb's equation for non equilibrium system.

CH103- CO3

Acquire knowledge about electrochemical cell EMF, applications of EMF measurements and electrode polarization.

CH103 – CO4

Understand the concept of activity, activity coefficient and learn to calculate mean activity coefficient. Know the concept of Ion Association

CH103 – CO5

Know about the Planck's concept of quantization, wave particle duality and have the idea about emergence of quantum mechanics

CH103 – CO6

Gain knowledge on quantum mechanical operator corresponds to each property, postulates of quantum mechanics and condition for simultaneous measurement of property – uncertainty principle

CH103 – CO7

Understand the concept of particle in box and calculation of average values using wave function of particle in box. Have an idea about the implementation of particle in box concept to the spectral calculation of conjugated molecule.

CH103 – CO8

Learn the theories of reaction rate and evaluate their merits and demerits. Know about complex reaction and derivation of their rate law. Analyze the effect of structure on reactivity.

Course outcomes of

M. Sc Chemistry - Semester I

Paper –IV

CH104 – CO1

Analyze the techniques of chromatography and generate quantification methods of HPLC and GC for industrial applications

CH104 – CO2

Identify the basic components of spectroscopic instrumentation.

CH104 – CO3

Interpret the NMR Spectra of organic compounds and gains knowledge on its applications in medicine and industries as a diagnostic tool.

CH104 – CO4

Compute bond length and atomic mass of diatomic molecule from the spectroscopic data of rotational spectroscopy

CH104 – CO5

Discriminate between harmonic and anharmonic vibrations

CH104 – CO6

Interpret the Infra red absorption frequencies of simple organic molecules.

CH104 – CO7

Calculate the relative populations of rotational and vibrational energy levels

CH104 – CO8

Gains knowledge on Uv- Visible spectroscopy principles and instrumentation and interpret Uv –spectra of organic molecules.

CH104 – CO9

Construct the absorption maxima of organic molecules with Woodward Fieser rules

CH104 – CO10

Understand the polarizability variation of ellipsoid of a molecule with rotation and vibration of molecules and presence of centre of symmetry element can be identified by applying rule of mutual exclusion .

Course outcomes of

M. Sc Chemistry - Semester II

Paper –I

CH201-CO1

Acquire the knowledge about different types of substitution reaction (SN1,SN2, SE) &hydrolysis reactions (acid, base)

CH201-CO2

Get concept about Trans effect, electron transfer reaction. Theories & application of Trans effect.

CH201-CO3

Understand about the terms, state, microstate etc &calculation of microstate &determination of terms of different configuration .Able to draw orgel diagrams of S, P, D, and F terms

CH201-CO4

Get the concept of capping rule, total electron count theory &poly skeletal electron pair theory .categories the types of clusters

CH201-CO5

Able to draw the structural patterns of different metal clusters

CH201-CO6

Acquires knowledge about various elements functions in biological system, photosynthesis, PS-I, PS-II &vitamin B6 model system. Comparison between the haemoglobin, myoglobin, heamocyanin & hemoerythrin

Course outcomes of

M. Sc Chemistry - Semester II

Paper –II

CH202-CO1

Aquire the knowledge about Evidenced based Nucleophilic Aromatic & Aliphatic Electrophilic reactions .

CH202-CO2

Able to understand the transitions in Photochemical reactions .

CH202-CO3

By the concept of Neibhouring group participation enhancement of reaction rates can be determined .

CH202-CO4

Interpretation of mechanism of pericyclic reaction by Aromatic transition state & Perturbation Molecular orbital approach .

CH202-CO5

Have an idea of different Molecular Rearrangements .

Course outcomes of

M. Sc Chemistry - Semester II

Paper –III

CH203 – CO1

Acquire knowledge on Thermodynamic properties of ideal and non ideal solutions, Concept of fugacity and activity coefficient, determination of fugacity and activity coefficient

CH203 – CO2

Learn to derive the equations of multi component phase equilibrium. Understand the brief concept of Statistical Thermodynamics with reference to distribution, probability and partition function

CH203 – CO3

Develop concept about electronically excited states and understand the photo physical processes through Jablonsky diagram. Learn to derive the expression of quantum yield and rate constants of various photo physical processes

CH203 – CO4

Know about the types of photo chemical reaction, photo sensitization reaction and have an idea about the advancement of studying fast reaction – Principle of Flash photolysis

CH203 – CO5

Learn to derive Schrodinger equation for hydrogen atom using polar coordinates. Have an idea about the generation of quantum number from the solution of wave equations, radial distribution and representation of orbitals.

CH203 – CO6

Know about approximate method (Variation principle) and execution of the method to derive the wave function of many electron systems. Understand the construction of MOs by LCAO, physical picture of bonding and antibonding orbital wave function and evaluation of merits and demerits of VB and MO theory.

CH203 – CO7

Acquire knowledge on the electronic properties of metals, insulators and semi conductors. Understand the theories and applications of superconductors and high temperature super conductors.

CH203 – CO8

Know the preparation , properties and characterization of nano materials

Course outcomes of

M. Sc Chemistry - Semester II

Paper –IV

CH204-CO1

Understands the instrumentation, principle of polarography, techniques and analyze the qualitative and quantitative applications

CH204-CO2

Understands the basics of thermo analytical methods, analyze the qualitative and quantitative applications in material science and interpret the experimental results

CH204-CO3

Understand the principles and techniques of Advanced NMR and interpret the NMR spectroscopic data for the structural elucidation of molecules.

CH204-CO4

Illustrate the techniques of mass spectroscopy, interpret the fragmentation pattern of organic molecules

CH204-CO5

Compute the molecular formula of compounds using mass spectroscopic data.

CH204-CO6

Knows the Principle and Instrumentation of Photoelectron Spectroscopy, Interpretation of Vibrational spectral data for ionized (M+) species.

CH204-CO7

Understands the measurement of binding energy of electrons emitted from solids, liquids and gases by photoelectric effect and Quantitative surface composition can be determined by XPS.

CH204-CO8

Discriminates different oxidation state and chemical environment using spectroscopic data of X-ray photoelectron Spectroscopy

CH204-CO9

Understands working principle of ESR Spectroscopy, identify the basic components of ESR spectrometer, interpret the ESR Spectra and analyze the qualitative applications in medicine and industries.

Course outcomes of

M. Sc Chemistry - Semester III

Paper –I

CH(OC)301 -CO1

Understand the need and method of protection of various functional groups

CH(OC)301 -CO2

Clarify the concept of Optical rotatory dispersion and its use for the determination of structure of chiral molecules

CH(OC)301- CO3

Acquire Knowledge of preparation and applications of organ metallic Reagents

CH(OC)301- CO4

Have an idea of CMR Spectra, its method of recording and applications

CH(OC)301- CO5

Discuss the factors governing the reactivity of axial and equatorial substituent's in cyclohexane

CH(OC)301- CO6

Judge various reagents used for oxidation and reduction reactions

CH(OC)301- CO7

Predict the type of reagent used for the desired chemical Reaction

Course outcomes of

M. Sc Chemistry - Semester III

Paper –II

CH(OC)302 -CO1 Know about Prostereoisomerism, prochiral nomenclature, conditions of stereo selectivity and analytical methods

CH(OC)302 -CO2

Understand the concepts of types of asymmetric synthesis controlled by chiral auxiliary, chiral catalyst, chiral substrate and chiral reagent with examples.

CH(OC)302 -CO3

Acquire knowledge about terminology, criteria for selecting target, synthesis involving chemo and regio selectivity, reversal of polarity and cyclisation involved in retro synthesis analysis.

CH(OC)302 -CO4

Explain order of events, one bond and two bond C-C and C-X disconnection and control in carbonyl condensation with examples.

CH(OC)302 -CO5

Define strategic bond and determine guidelines for disconnection with greatest simplification using symmetry and corresponding to known reliable reactions

CH(OC)302- CO6

Design Retro synthesis of Retronecene, Longifoline.

CH(OC)302 -CO7 Determine new synthetic reactions involving c-c coupling reaction, c=c formation reaction, multi component reactions, Ring formation reactions, ring opening & closing, metathesis, 1,3 dipolar cycloaddition reaction .

CH(OC)302 -CO8 Explain the new techniques and concepts used in synthesis of peptides ,oligosaccharides and oligodeoxynucleotides

CH(OC)302 -CO9 Relate Baldwin rules for cyclisation of various compounds

CH(OC)302 -CO10 Understand Chiron approach in organic synthesis & determine the absolute configuration by Mosher's method.

Course outcomes of

M. Sc Chemistry - Semester III

Paper –III

CH(OC)303 -CO1

Determine the configuration and ring size of sugars and conformational analysis of monosaccharide.

CH(OC)303 -CO2

Have an Idea on the structure, synthesis, ring size determination, and conformational structure of different types of carbohydrates.

CH(OC)303 -CO3

Acquire the knowledge on primary, secondary and tertiary structure of DNA and RNA and their different types.

CH(OC)303- CO4

Know the Replication, transcription, translation, genetic code and DNA fingerprinting ,structure and synthesis of nucleosides and nucleotides.

CH(OC)303- CO5

Acquire the knowledge on the nomenclature, biological importance of different structure of proteins and bonding of peptides.

CH(OC)303 CO6

Understand the mechanism of action and factors affecting enzyme catalysis, Enzyme inhibition and immobilized enzymes.

CH(OC)303- CO7

Illustrate the Classification, structure, biosynthesis and biological functions of different type of Coenzymes, vitamins, Lipids, phospholipids and glycolipids.

Course outcomes of

M. Sc Chemistry - Semester III

Paper –IV

CH(OC)304 CO1

Know about the various nano materials &their synthesis by top-down, bottom-up approaches.

CH(OC)304 CO2

Understand the microwave assisted organic reaction

CH(OC)304 CO3

Have an idea about phase transfer &biocatalysts in organic synthesis.

CH(OC)304 CO4

Acquire the knowledge about Enantioselective molecular recognition & host- guest relationship of supra molecules

CH(OC)304 CO5

Know about the recent advances in nano materials &supra molecules

CH(OC)304 CO6

Designing the green synthesis using principles &prevention of waste byproduct or toxic byproducts**,** atom economy

Course outcomes of

M. Sc Chemistry - Semester IV

Paper –I

CH(OC)401 -CO1

Explain the stages involved in drug discovery

CH(OC)401 -CO2

Relate the various Lead modification strategies to drug development process with examples

CH(OC)401- CO3

Compute the Structure-Activity Relationship studies in sulfa drugs,benzodiazepines, and taxol analogs

CH(OC)401- CO4

Compare the various physicochemical properties of drug molecules and the relationship between these and biological activity

CH(OC)401 –CO5

Explain the various tools used in QSAR studies and how these are applied in the design of drugs using examples

CH(OC)401- CO6

Illustrate the principles of Computer aided drug design

CH(OC)401 –CO7

Execute the Combinatorial approach in the process of drug discovery and plan and design combinatorial synthesis

Course outcomes of

M. Sc Chemistry - Semester IV

Paper –II

CH(OC)402 –CO1

Classify and discuss the mode of action of drug acting on the various receptors

CH(OC)402 –CO2

Overview of nervous system and nerve transmission

CH(OC)402 –CO3

Gain the Knowledge of various Macromolecular targets of Drugs

CH(OC)402 –CO4

Have an idea about the recent advances in Drug Discovery

CH(OC)402 –CO5

Outline the discovery and mechanism of action of some important drugs

CH(OC)402 –CO6

Know about the Drugs and their structure

CH(OC)402 –CO7

Can explain the chiral drugs and pharmacological activity of some important chiral Drugs

Course outcomes of

M. Sc Chemistry - Semester IV

Paper –III

CH(OC)403 –CO1

Know about the types of heterocyclics & importance of various types of heterocyclics.

CH(OC)402 –CO2

Understand the synthesis & reactivity of non aromatic heterocyclic compounds.

CH(OC)402 –CO3

Acquire the knowledge about the importance of purines & pyrimidines in various drugs.

CH(OC)402 –CO4

Focusing on the differences between saturated & unsaturated heterocyclic compounds.

CH(OC)402 –CO5

Have an idea about recent advances in drug synthesis by usefulness of five & six membered heterocyclic compounds with hetero atoms.

CH(OC)402 –CO6

Predict the aromaticity of both benzenoid & non- benzenoid aromatic compound based on Huckel's rule.

Course outcomes of

M. Sc Chemistry - Semester IV

Paper –IV

CH(OC)404 –CO1

Determine the biosynthetic mechanism, biosynthetic precursors with the help of feeding experiments of secondary metabolites.

CH(OC)404 –CO2

Evaluate Acetate –malonate pathway, Shikimmic acid pathway and Mevalonic acid pathway of secondary metabolites with examples.

CH(OC)404 –CO3

Determine structure and stereochemistry of Morphine, Reserpine, Abietic acid, Cholesterol and Rotenone.

CH(OC)404 –CO4

Determine Structure of natural products through Spectroscopic techniques.

CH(OC)404 –CO5

Understand of solved spectral problems of Geraniol, Menthol, Apparicine, Stricticine, Buxaquamarine, α-Picoline and β-Methyl furan.

CH(OC)404 –CO6

Critique the total stereo selective synthesis like Nicalou's synthesis of Dynemycin A, Taxol, Corey's Synthesis of Prostaglandins and Pacoriflorin, Sharpless synthesis of L-Hexoses, Danishefsky synthesis of Indolizomycin, Takasago synthesis of Menthol, Hoffmann-LaRoche synthesis of Biotin.