Programme- B.Sc.

Course- B.Sc Ist Semester/ Paper I (Inorganic Chemistry)

Objectives-

To explain the different modes of atom, atomic structure, quantum numbers and probability distribution curves.To explain the different theories of chemical bonding and multicentre bonding in electron deficient-compounds, Lattice energy, Polarizability and polarizing power of ions and also the chemistry of noble gases, oxides and structural principles of silicates.

Course Outcomes-

1) The students are able to explain different modes of atom, theories of atomic structural q.m. and probability distribution curves.
2) Students are also able to explain Lattice energy, polarising power and polarisability of ions chemistry of noble gases, oxides and structural principles of silicates.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc Ist Semester/ Paper II (Organic Chemistry)

Objectives-

To discuss basis organic chemistry.Give complete review of Alkenes, Alkene, Alkyne and diene.

Course Outcomes-

Students came to know following

1) Hybridization.
2) Halogenations of alkanes.
3) Stability and reactivity of alkane.
4) Difference between saturated and unsaturated hydrocarbon.
5) Saytzeff and Hoffmann elimination.
6) Acidic character of hydrogen of alkyne.

Assessment- By the external examination at the end of the semester.

B.Sc. I (Sem-I)

Physical Chemistry-P-III

Course Objectives:

To make the students conversant with-Elementary mathematical concepts,Gas laws & various equation of stakes,Critical phenomena in gases,Liquid states & mesomorphic states.

Outcomes-

At the end of the courses, the students are expected to have-

- Ability to understand mathematical derivations.
- Knowledge of gas law & critical phenomena in gas.
- Knowledge of liquid crystals & properties of liquid.

Programme- B.Sc.

Course- B.Sc Ist Semester II/ Paper I (Inorganic Chemistry)

Objectives-

To acquaint the different periodic properties. To provide different vertical & horizontal trends of various periodic properties in periodic test.

Course Outcomes-

i. The knowledge of periodic properties like atomics ionic size, ionisation energy, electron energy, electron affinity, electronegativity.
ii. Prediction of chemical behaviour of elements & their compounds by the help of periodic properties.
iii. Vertical changes of properties of isolated atoms, melting point, enthalpy of atomisation, reduction potential, enthalpy of formation of compounds among s & p block elements of periodic table.
iv. Vertical variation in structure and bonding, oxidation states, inert pair & alteration effect, ionic-covalent transition and stability of salts of s & p block compounds.
v. Horizontal trends of metallic character, oxidation states, valencies, reduction potentials & ionic-covalent transition among periods of s & p block elements.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc Ist Semester II/ Paper II (Organic Chemistry)

Objectives-

To discuss about aromatic character of benzene and mechanism of aromatic electrophilic substitution.To explain mechanism of SN^1 and SN^2 reaction.To discuss about stereo isomerism.

Course Outcome-

Students come to know following

1) Aromaticity.
2) Satiability of benzene.
3) Electrophilic aromatic substitution.
4) Mechanism of SN^1 and SN^2.
5) Explanation of optical activity.
6) Conformation of cyclohexane and n-butane.

Assessment- By the external examination at the end of the semester.

B.Sc. I (Sem-II)

Physical Chemistry-P-III

Course Objectives:

To make the students knowledge to Crystalline state of solids.Colloidal state and the rate and kinetics if chemical reactions.Theoretical principles of occurrence of chemical reactions.

Outcomes-

The student will be familiar to

- The structure of solids & the way to determine the structure of crystalline solids.
- Colloidal state Nature of charged colloids electrical & optical properties of colloidal particles.
- Theoretical basis of chemical reactions. Justification of kinetics of gaseous reaction by collision theory and TST.

Programme- B.Sc.

Course- B.Sc IInd Semester III/ Paper I (Inorganic Chemistry)

Objectives-

To Explain the electronic configuration size and different properties of Ist and IInd transition series.To provide different concepts of acids and bases, comperative strength of hydrides halides, oxides, oxyacids and oxyanions of representative element.

Course Outcomes-

The students are able to explain about-

1) Different properties of Ist and IInd transition series.
2) Different concepts of acids and bases and cooperative strength of hydrides, halides, oxyacids of representative elements.
3) All about hard and soft acids and bases.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc IInd Semester III/ Paper II (Organic Chemistry)

Objectives-

To discuss the difference between primary alcohol, secondary alcohol and tertiary alcohol and the chemical reactions of alcohol and phenol.To discuss the basic principles of spectroscopy and also important rule of ultra violet and intra-red spectroscopy in the study of structure of organic compounds.

Course Outcomes-

The students must be able to-

1) To understand the synthesis and chemical properties of alcohols and phenols.
2) To explain the mechanism of the organic reaction explained during the course.
3) To understand the application of spectroscopy.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc IInd Semester III/ Paper III

Physical Chemistry (Thermodynamics)

Objectives-

To understand the nature and role of the following thermodynamics properties of matter: internal energy, enthalpy, entropy, temperature, pressure, specific volume and able to access thermodynamic property data from appropriate sources.To recognize and understand the different forms of energy and restrictions imposed by the first law of thermodynamics on conversion from one from to another and able to apply the first law to a control mass or control volume at an instant of time or over a time interval.

Course Outcomes-

- A fundamental understanding of the first and second laws of thermodynamics and their application to a wide range of systems.
- Understanding of the first law of thermodynamics and various forms of work that can occur.
- An ability to evaluate entropy changes in a wide range process and determine the reversibility or irreversibility of a process from such calculations.
- Familiarity with calculations of the efficiencies of heat engines and other engineering devices.
- An understanding of the use of the Gibbs and Helmholtz free energies as equilibrium criteria, and the statement of the equilibrium condition for closed and open systems.

Assessment-

By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc IInd Semester IV/ Paper I (Inorganic Chemistry)

Objectives-

To explain the electrode potential, electro chemical series and frost, Latimer and pourbaix diagrams.To introduce about the coordination compounds effective atomic number concept and different types isomerism.To introduce about an aqueous solvents their general characteristics, reactions with reference to liquid NH_3 and liquid SO_2, properties and uses of silicones and phosphazines.

Course Outcomes-

The students are able to explain about-

1) Electrode potential, electrochemical series and different diagram such as Latimer, Frost and pourbaix.
2) About the coordination compounds EAN concept and different types of isomerism.
3) About an aqueous solvents their characteristics and reaction with reference to liquid NH_3 and liquid SO_2 .
4) Preparation and properties of silicones and phosphazines.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc IInd (Semester IV)/ Paper II (Organic Chemistry)

Objectives-

To discuss the synthesis and important chemical reaction of aldehyde and ketone.To explain the reactions of carboxylic acids and its conversion into acyl chloride, ester, anhydride, etc.

Course Outcome-

Students must be able to

1) To recognize the structure of ether and epoxide.
2) To understand the relative lack of reactivity of ether and the reactivity of epoxide.
3) To distinguish between primary, secondary and tertiary amines and also have concept of basicity of amines.

Assessment- By the external examination at the end of the semester.

Programme- B.Sc.

Course- B.Sc IInd (Semester IV)/ Paper III

(Physical Chemistry-Electrochemistry)

Objectives-

Understand basic knowledge if electrode potential & electrochemical cells and differentiate between electrolytic and electrochemical cells.Explain the various methods for the determination of transference number and Acquire basic principles underlying electro-analytical techniques.

Course Outcome-

- Familiarity with calculations of the various methods for the determination of transference number.
- An ability to evaluate and determine the solubility of sparingly soluble salts.
- Explain the concepts of electrolytic and electrochemical cells.
- An understanding of the use of the basic equations of electrochemistry and their applications to electro-analysis.
- State the basic principle underlying electro-analytical techniques.

Assessment-

External assessment is done after the completion of the semester.

Programme- B.Sc.

Course- B.Sc IIIrd Semester V/ Paper I (Inorganic Chemistry)

Objectives-

To learn about special bonding aspects of s & p-block compounds.To study bonding and some properties of transaction metal Complexes.

Course Outcome:

Students must be aware & proficient in

i. Drawing and analysing Walsh diagrams, significance of Bents rule, d-p bonding & energies of hybridisation.
ii. Bonding model of Crystal Field theory among different geometries of transition metal Complex.
iii. Details of magnetic nature and their applications among transition metal complexes.
iv. Basic information about electronic transition and their applications among transition metal complexes.

Assessment- Students are assessed for their theoretical & analytical knowledge at the end of the semester.

Programme- B.Sc.

Course- B.Sc IIIrd Semester V/ Paper II (Organic Chemistry)

Objectives-

To understand the important role of nuclear magnetic resonance spectroscopy in the study if the structures if organic compounds by developing an understanding of the significance of the number, positions, intensities, and splitting of signals in nuclear magnetic resonance spectra. Recognize and understand the different types if heterocyclic compounds (Five, six, and fused compounds) by developing the understanding of basic and aromatic properties of different heterocyclic systems.

Course Outcome:

Upon completion of this course, the student will be able to:

- Demonstrate an understanding of basic principles of NMR spectroscopy to develop the understanding to solve the numerical problems in organic chemistry.
- Demonstrate problem solving and critical thinking skills.
- Apply methods of formation for different types of organic chemistry.
- Use instruments and laboratory techniques of organic chemistry.
- Demonstrate an understanding of the chemical environment and the role that organic molecules play in the natural and the synthetic world.

Assessment-

External assessment is done after the completion of the semester.

B.Sc. IIIrd (Sem-V)

Physical Chemistry-P-III

Course Objectives:

To make the students learn inadequacy of classical mechanics and need of quantum mechanics,Acquainted with schrodinger wave equation & its solution,Knowledge with basic concepts of spectroscopy.

Outcomes- the students will knowledged with

- Basic concept of quantum mechanics.
- Consequence of interactions of radiation & matter with aspects of spectroscopy.
- Photochemical reactions.

B.Sc. IIIrd (Sem-V)

Bio-Chemistry-P-IV

Course Objectives:

Describe/recognize amino acid structures, describe their physical and chemical properties and predict how their ionic charges change with pH and define primary, secondary, tertiary and quaternary structure in proteins and identify the types of interactions important in each case.List the essential and non-essential amino acids and describe the general strategies for amino acid synthesis an describe/recognize the structure of nucleic acids, DNA, and RNA.

Outcomes-

Upon completion of this course, the student will be able to:

- Demonstrate an understanding of basic knowledge about DNA, RNA and genetics codes.
- Demonstrate problem solving and critical thinking skills about biological systems.
- Understand the different types of structures of proteins.
- Must aware about diffusion and facilitated diffusion.
- An understanding of the linkages in peptides.

Assessment-

External assessment is done after the completion of the semester.

Programme- B.Sc.

Course- B.Sc IIIrd Semester VI/ Paper I (Inorganic Chemistry)

Objectives-

To acquaint students with chemistry of f-block.Basic information of organometallic compounds.Stability aspects of transition metal complexes.

Course outcome:

Students are expected to be aware of following at the end of the course-

i. Different types of stabilities and factors affecting them among transition metal complexes.
ii. Naming, preparation methods, chemical properties with some homogeneous catalytic properties of organometallic.
iii. Different aspects of Lanthanide chemistry.
iv. Various aspects of Actinide chemistry and their comparison with lanthanides.

Assessment- Students are assessed for their theoretical, analytical and numerical abilities at the completion of the semester.

Programme- B.Sc.

Course- B.Sc IIIrd Semester VI/ Paper II (Organic Chemistry)

Objectives-

Provides students with an opportunity to identify different types of polymers in our surrounding and introduces students to the practical application of polymers.To understand the basic knowledge of classification of dyes based on different colour bearing groups and introduces students to different polymerization techniques anionic, cationic and free radical.

Course outcome:

Upon completion of this course, the student will be able to:

- Demonstrate an understanding of basic knowledge of dyes and their applications in different fields.
- Demonstrate problem solving and critical thinking skills about polymer and their applications.
- Apply methods of formation for different types of polymers.
- Use instruments and laboratory techniques for preparation of different polymers in laboratory.
- An understanding of the cleansing action of soaps and micelle formation.

Assessment-

External assessment is done after the completion of the semester.

B.Sc. IIIrd (Sem-VI)

Physical Chemistry-P-III

Course Objectives:

The students must be informative and conversant with IR spectroscopy and its application to structural determination of molecules,Raman spectra as a complementary to IR spectra,Electronic spectra, its application to structural problems,Ionic interaction and electrochemistry,DHLL for electrical conductance in ionic solutions of strong electrolytes,Studying and evaluation of colligative properties of non-electrolytic solutions.

Outcomes-

The students would have been knowledged with the-

- Application of I R Raman & uv-visible spectral techniques regarding structures of molecules.
- Behaviour of ions in solution and correlation of przp. Of ionic solution with activity of ions.

B.Sc. IIIrd (Sem-VI)

Physical Chemistry-P-IV (Bio-Chemistry)

Course Objectives:

Define mono, di, and polysaccharides and their structures and describe the ring lengthening and ring shortening in carbohydrates. Describe/recognize the structure of mono-, di-, and polysaccharides, describe their physical and chemical properties and their functions in living organisms and predict the products of chemical reactions of carbohydrates (acetal/hemiacetal formation or oxidation).

Outcomes-

Upon completion of this course, the student will be able to:

- Demonstrate an understanding of basic knowledge about carbohydrate.
- Demonstrate problem solving and critical thinking skills about the importance of metals in biological systems.
- Understand the difference types of structures of carbohydrates.
- Must aware about interconversion of carbohydrates.
- An understanding the mechanism like mutarotation, epimerization and glycosidic linkages.

Assessment-

External assessment is done after the completion of the semester.

Programme- M.Sc.

Course- M.Sc Ist Semester I/ Paper I (Transition Metal Chemistry)

Objectives-

To equip students with mechanism of reactions, anyl and alkyl derivatives; clusters formed by transition metals.Basic Information regarding different types of Boron hydrides isopoly & hetropoly acids.

Course outcome:

At the end of the course students must be well acquainted with-

i. Various aspects of mechanism of substitution reaction among octahedral and square planer complexes along with basic kinetics of substitution reactions.
ii. Introductory remarks about carbonyl clusters, their rules & their derivatives.
iii. Preparation, properties and structures of various Boron hydrides & their derivatives.
iv. Basic information's regarding iso & hetero polyacids & their salts.
v. Synthetic routes, decomposition pathways and stability among alkyls & aryls of transition metals.

Assessment- Students are assessed for their theoretical, analytical and numerical abilities at the completion of the course.

Programme- M.Sc.

Course- M.Sc Ist Semester I/ Paper II (Reaction mechanism)

Objectives-

To discuss benzenoid and non-benzenoid compound and anesium ion mechanism. To discuss about the neighbouring group mech.

Course outcome:

Students come to know following

1) Benzenoid and non-benzenoid compound.
2) Optical activity of biphenyls, Allenes and spiranes.
3) Neighbouring group participation by π and σ bonds.
4) Orientation and reactivity.
5) Vilsmeier and Gattermann Koch reaction.
6) Aromatic nucleophilic substitution.

Assessment-

1) By the external examination at the end of semester.
2) Internal assessment by student seminar.

Programme- M.Sc.

Course- M.Sc Ist Semester I/ Paper III

(Physical Chemistry)

Objectives-

To make the students conversant with-

- Solution of Schrodinger wave eqn for simple systems like particle in 3-D box, harmonic Oscillator, rigit rotor, H-atom etc.
- Application of variation and perturbation method to He-atom.
- Concept of partial molar properties of solution, chemical potential and significance of Gibbs' Duhem-Margules equation.
- Concept of irreversible thermodynamics, Huxes, forces and related pharmacological equations.

Course outcome:

The students will knowledge with-

- Understanding the energy calculations of real microscopic particles viz. e^-s, harmonic oscillator, rigid rotor etc.
- Calculations and applications of approximate methods in quantum mechanics.
- Partial molar properties like chemical potentials and their significance in thermodynamics of solutions.
- Concept of thermodynamically calculations in irreversible process.

Programme- M.Sc.

Course- M.Sc Ist Semester I/ Paper III

Physical Chemistry- (Quantum, Thermodynamics)

Objectives-

1. Understand and explain the differences between classical and quantum mechanics and understanding and relating the events which led towards the development of quantum mechanics.
2. Be able to apply the thermodynamics

Course outcome:

- An ability to evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations.
- An understanding of the use of the Gibbs and Helmholtz free energies as equilibrium criteria, and the statement of the equilibrium condition for closed and open systems.
- Solve Schrodinger equation for one electron systems and identify and relate the Eigen value problems for energy, momentum, angular momentum and central potentials explain the idea of spin.
- Understand about exact and inexact differentials
- An understanding of approximate methods (variation and perturbation) and its applications in many electron system,

Assessment

External assessment is done after the completion of the semester

Programme- M.Sc.

Course- M.Sc Ist Semester / Paper IV (Analytical Chemistry)

Objectives-

To provide the definition of terms in mean, median, types of errors, source of errors and the uses of statistics, different types of thermal analysis, such as thermo gravimetry, differential thermal analysis, differential scanning calorimetry and thermo metric titrations.To discuss modern voltammetric methods sampled polarography, pulse polarography, cyclic valtammetry, AC polarography and different types of chromatography and acid base equilibria and buffer solution.

Course outcome:

The students are able to explain about-

1) Definition and terms in mean, median, types of error and source of errors.
2) The different types of thermal analysis such as TGA, DTA, DSC and thermometric titrations.
3) Modern voltammetric methods.
4) Different types of chromatography and acid base equilibria and buffer solution.

Assessment-

1) By the external examination at the end of the semester.
2) Internal assessment by student seminar.

Programme- M.Sc.

Course- M.Sc IInd Semester / Paper I (Molecular symmetry and group Theory)

Objectives-

To provide the knowledge about DNA polymerization glucose storage etc., structure and function of haemoglobin, myoglobin, hemocyanin, hemerythrin.To explain about Nitrogenase, several zinc, copper, molybdenum and cobalt containing metaloenzymes, electron transfer in biology and role of metals in medicive.

Course outcome:

The students are able to explain about-

1) DNA polymerization and glucose storage.
2) Structure and function of haemoglobin, myoglobin, haemocyanin and haemerythnin.
3) Nitrogenase, several metalloenzymes.
4) Electron transfer in biology and role of metals in medicine.

Assessment-

1) By the external examination at the end of semester.

Programme- M.Sc.

Course- M.Sc Semester- IInd / Paper II

(Reaction mechanism-II and Organometallics)

Objectives-

To describe the mechanism and stereochemical aspects of the elimination reaction and to discuss the influence of the alkyl group, the nature of the leaving group, the reagent and solvent on elimination reaction.To discuss the mechanism of some pericyclic reaction embracing a variety of processes including cycloaddition, chelotropic reaction, electro cyclic reaction and sigmatropic rearrangement.

Course outcome:

Students must be able:

1) To explain concerted reaction involving a cyclic flow of electron through a single transition state.
2) To explain the mechanism of the organic reaction explained during the course.

Assessment-

1) By the external examination at the end of the semester.
2) Internal assessment by student seminar.

Programme- M.Sc. I Semester- IInd

Paper III: Physical Chemistry

(Dynamics, Surface and Electro)

Objectives-

To describe the general form of a (differential) rate law and describe how the rate of a chemical reaction depends on the concentrations of aspects that appear in the rate law and further describe the relationship between the order of a reactant and the stoichiometric coefficient for the reactant in the overall balanced chemical equation. Understanding of Debye Huckel Onsager Theory for strong electrolytes.

Course outcome:

- An ability to evaluate reaction rates by using steady stake kinetics
- An understanding of the use of the Gibbs and Helmholtz fre energies in transition state theory
- Solve problems related to surface area by BET equation
- Understand about Ilkovic equation and half wave potential in polarography.
- An understanding of primary and secondary salt effect in study the rate of simple and complex reactions.

Assessment-

External examination at the end of the semester.

M.Sc. Ist (Sem-II)

Spectroscopy-(P-IV)

Course Objectives:

The students are well understanding the Interaction of tradition with matter and the consequence provide basic principles of spectroscopy,Microwave spectra,Demonstration of IR and Raman spectra for diatomic and polyatomic molecules,Analysing IR and Raman frequencies,Various types of electronics transition in uv-spectra and characteristics of absorption maxima,X-ray-spectroscopic techniques for studying the internal structure of crystals.

Outcomes-

The student's will-

- Knowledged with theoretical basis of molecular spectroscopy and spectral line parameters.
- Be able to understand & practice the spectroscopic methods for determination of structure of both organic and inorganic molecules.

M.Sc. (Sem-III)

Spectroscopy-(II)

Paper-I

Course Objectives:

To make students To know how the nuclear management moment constitutes the basic of NMR and ESR spectroscopic methods,Analysis of complicated NMR-spectrum by the use of magnetic double resonance, contact-shift reagents etc,Understanding NOE, FTIR, Karpus-dihedral equation,Learning C^{13}-NMR spectral data,To study the structure of free radicals, & paramagnetic and several odd e-species using ESR spectra,Knowledged with photo electron spectroscopy & its application.

Outcomes-

Students will be able to learn and skilled with-

- NMR-methods & analysis the spectrum; obtained.
- Advance spectroscopic techniques for determining the structure & properties of compounds.

M.Sc. (Sem-III)

Organic synthesis –I and Photochemistry

Paper-II

Course Objectives:

To identify organic reactions as being oxidation/ reduction and to discuss different oxidative and reductive process and the mechanism and stereochemistry of some organic reactions. The discuss the chemical reaction, isomerization that occur under the influence of uv/ visible light.

Outcomes-

Students must be able

1. To understand fundamental principles that are foundational to understand photochemical transformations.
2. To apply the organic reaction covered in the synthesis of complex organic molecules.
3. To define reaction condition for different types of organic transformations.

M.Sc. (Sem-III)

Coordination Chemistry

Paper-III-A

Course Objectives:

To acquaint students with various aspects of bonding in coordination compounds. Spectral & magnetic nature of complexes of different geometrics.

Outcomes-

Students must be able to understand the problems regarding concepts and applications regarding.

i) Electronic configuration is multi-electron system.
ii) MOT of different complexes of various geometries.
iii) Spectral properties of geometries and their distortions.
iv) Calculation of terms & their uses in different ligand fields.
v) Magnetic nature of some specific complexes of oh, Td and D_4h complexes.

Assessment-

Students are assessed for their conceptual, theoretical as well as analytical at the end of the course.

M.Sc. (Sem-III)

Medicinal Chemistry

Paper-III-B

Course Objectives:

To discuss the overall process of drug discovery and the role played by medicinal chemistry and also the structure and physical properties of drugs to their pharmacological. To give brief knowledge of cancer chemotherapy and role of hormone and natural products in cancer chemotherapy.

Outcomes-

Students must be able

i) To understand the basic concept of drug design.
ii) To understand the structure and mode of action of antifungal, ant malarial and antiviral drugs.

Assessment-

By the external examination at the end of semester.

M.Sc. (Sem-III)

(Solid State) (Elective)

Paper-III-C

Course Objectives:

Students will be familiar to Imperfections in crystals,Bond theory for the crystalline structures of metals,Types of semi-conductor and junctions,Solid state reactions,Magnetic, dielectrically and optical properties of solid.

Outcomes-

Students will be familiar to-

i) Solid-State chemistry concerned to structures & properties.
ii) Fantastic superconductivity behaviour of solids.

M.Sc. (Sem-III)

Structural Inorganic Chemistry

Paper-IV-A

Course Objectives:

The students are to be provided details of various spectroscopic techniques used in illustration of structure of Inorganic Compounds.

Outcomes-

Students must be equipped with-

i) NMR spectroscopy for inorganic compound.
ii) ESR spectroscopy techniques for inorganic compounds & ious.
iii) Basic of Moss bauer pectroscopy & its application in inorganic chemistry.
iv) Vibrational spectroscopy to illucidate symmetry & shape of inorganic molecules.
v) Basic of Molecular spectroscopy & its use in transaction metal Complex.

Assessment:

The external assessment of students at the end of the course.

M.Sc. (Sem-III)

Chemistry of natural product

Paper-IV-B

Course Objectives:

To discuss basic concept of Terpenoids, Carotenoids, Alkaloids and Steroids and plant Pigments.

Outcomes-

Students comment to know following

i) About citral, Menthol and Carotene.
ii) Complete synthesis of cholesterol.
iii) Role of Mg in chlorophyll and Fe in Haemoglobin.
iv) Classification and physiological effects of prostaglandins.
v) Synthesis of PGE_2 and PGF_2O.
vi) Uses of natural products.

Assessment:

The external assessment of students at the end of the course.

M.Sc. (Sem-III)

Chemical kinetics

Paper-IV-C

Course Objectives:

To make the students learning of Statistical approach to TST and various modified form of theories of reaction rates viz. Lindeman, Hinshelwood, RRK etc,Chemical kinetics and factors affecting reaction rates in fast reactions,Kinetics in polymerisation reactions.

Outcomes-

After completion of courses student came to know-

- Absolute reaction rate theories for reactions.
- How the rates of reactions determined in reactions occurring in solutions.
- Hammett equation and Linear free energy relationship in few organic reactions.
- Fast reaction kinetics and kinetics in polymerisation.

M.Sc. (Sem-III)

ELECTRO CHEMISTRY

Paper-IV-D

Course Objectives:

To make the students conversant with Basics of ionic-interactions in solutions,Concerned theories with ionic behaviour in solutions viz DHLL, DHO, Bjerrum equation etc,Electro Kinetics in electrochemistry,Concept of electro catalysis.

Outcomes-

The students will become to

- Understand the ions behaviour in solutions.
- Advanced theories concerned to electrochemistry.
- Electro kinetics & electrolysis of cells.

M.Sc. (Sem-IV)

Environmental Chemistry

Paper-I

Course Objectives:

To analyse the water for measuring their BOD, COD, DO, F, oils and metals analytical methods for measuring air pollutants. To discuss the Bhopal gas tragedy, Chernobyl Three mile island and Minamata disasters.

Outcomes-

1. They are able to help social groups and individuals to aware the sensitivity to the total environment and several problems.
2. The students are able to analyse the water for their DO, BOD, COD, F oils and metals.
3. They know several types of industrial pollution, Bhopal gas tragedy Minamata disasters, three mile islands etc.

Assessment-

1. By external examination at the end of semester.
2. Internal assessment by student project.

M.Sc. (Sem-IV)

Organotransition Metal Chemistry

Paper-II

Course Objectives:

The students must be acquainted with the various aspects of Organometallic compounds of d-block.

Outcomes-

At the end of the course, students must acqura detailed knowledge about-

i) Fluxionality of Organomettalic Compounds.
ii) Metal Carbonyl and nitrosyl compounds.
iii) Different catalytic process using organometallic compounds as catalyst.
iv) Complex cartaining different π-bonding ligands.

Assessment-

The students are judged for their knowledge by external assessment at the end of the semester.

M.Sc. (Sem-IV)

Photoinorganic Chemistry

Paper-III-A

Course Objectives:

To finish knowledge regarding photo chemistry for their basics, advances and applications in metal complex.

Outcomes-

Students are equipped with information regarding

i) Basic of Photochemistry
ii) Properties of excited states and deactivation
iii) Exeited states of Metal Complex and change transfer spectra.
iv) Photochemistry of ligand fields.
v) Redox reactions in some exeited metal complexes.
vi) Metal Complex sensitizers in different chemical system.

Assessment-

Students are assessed for their theoretical and analytical abilities at the end of the semester.

M.Sc. (Sem-IV)

(Organic Synthesis –II)

Paper-III-B

Course Objectives:

To explain the retro synthetic analysis technique of simple and complex organic molecule synthesis such as camphor, reserpine. To discuss importance of protecting group in organic synthesis.

Outcomes-

1. Students must be aware of the idea of the retro synthetic analysis and be able to propose synthetic routes.
2. Students are able to identify the type of transformation required to obtain a Target Molecule.

Assessment-

1. By the external examination at the end of semester.
2. By the internal assessment by student project.

M.Sc. (Sem-IV)

(Advance quantum mechanics)

Paper-III-C

Course Objectives:

To make the students Learn the inadequacy of classical mechanics and the origin of quantum mechanics,Apply the principles of quantum mechanics to simple atoms & molecules,Ab-initio calculation for closed shell systems,Huckel theory of conjugated system,Perturbation theory to He-atom.

Outcomes-

1. Basic ideal of quantum theory.
2. Ab-initio calculations.
3. Evaluating energies of various MOs in conjugated systems.

Assessment-

3. By the external examination at the end of semester.
4. By the internal assessment by student project.

M.Sc. (Sem-IV)

(Analytical Chemistry)

Paper-IV-A

Course Objectives:

To analyse the moisture ash, different adulterants, pesticides in food products by HPLC, gas chromatography and their layer chromatography. To analyse the water pollutants such as chloride, sulphate, fluoride Silica, phosphate and different forms of Nitrogen.To analyse the soil, fuel, body fluids and drugs by different analytical methods.

Outcomes-

The students must able to explain-

1. About the analysis of food.
2. Analysis of the water pollutants such as chloride, sulphate, Fluoride, silica and phosphate.
3. Analysis of the soil, fuel, body fluids and drugs by different-analytical methods.

Assessment-

1. Internal assessment by student project.
2. By external examination at the end of semester.

M.Sc. (Sem-IV)

(Heterocyclic Chemistry)

Paper-IV-B

Course Objectives:

To discuss nomenclature synthesis and chemical reaction of Heterocyclic compounds.

Outcomes-

Students come to know following-

1. Nomenclature of heterocyclic compound.
2. Cyclization and cycloaddition reaction.
3. Basicity of Pyrrole and Pyridine.
4. Meso ionic compound Type A and Type B.
5. Synthesis and reaction of coumarins and chromones.
6. Medicinal application of heterocyclic compounds.

Assessment-

1. By the external examination at the end of semester.
2. Internal assessment by student project.

M.Sc. (Sem-IV)

(Enzyme Chemistry)

Paper-IV-C

Course Objectives:

To discuss mechanism of enzyme action. To discuss structure and biological functions of coenzymes A. NDA^{+}, $NADP^{+}$, FAD.

Outcomes-

Students come to know following-

1. Mechanism of enzyme action.
2. About enolic intermediates in isomerization reaction.
3. Enzyme catalyzed carboxylation and decarboxylation.
4. Structure and biological function of Coenzyme.
5. About crown ethers, cryptates.
6. Transition state theory.

Assessment-

1. By the external examination at the end of semester.
2. Internal assessment by student project.

M.Sc. (Sem-IV) (Elective)

(Statistical thermodynamics)

Paper-IV-D

Course Objectives:

To make the students conversant with Statistical mechanics and terminologies.Various types of distribution law viz. Maxwell-Boltzmann, Fermi Dirac, Base-Einstein. Partition function and its significance.Heat capacity of solids & concerned theories.

Outcomes-

Students are familiar with-

1. Basic concept of statistical thermodynamics.
2. Various types of statistical distribution laws.
3. Estimation of heat capacity of solids.

M.Sc. (Sem-IV)

(Chemistry of Materials)

Paper-IV-E

Course Objectives:

To offer concepts, properties, types of industrially important materials.

Outcomes-

Students must be competent about Study of different type of alloys,Study of Ceramics, Composites and nano materials,Study of Thin & Langmuir-Blodgett films,Study of polymeric materials,Study of Ionic conductors,Study of high Te Materials.

Assessment-

External assessment at the end of the semester.