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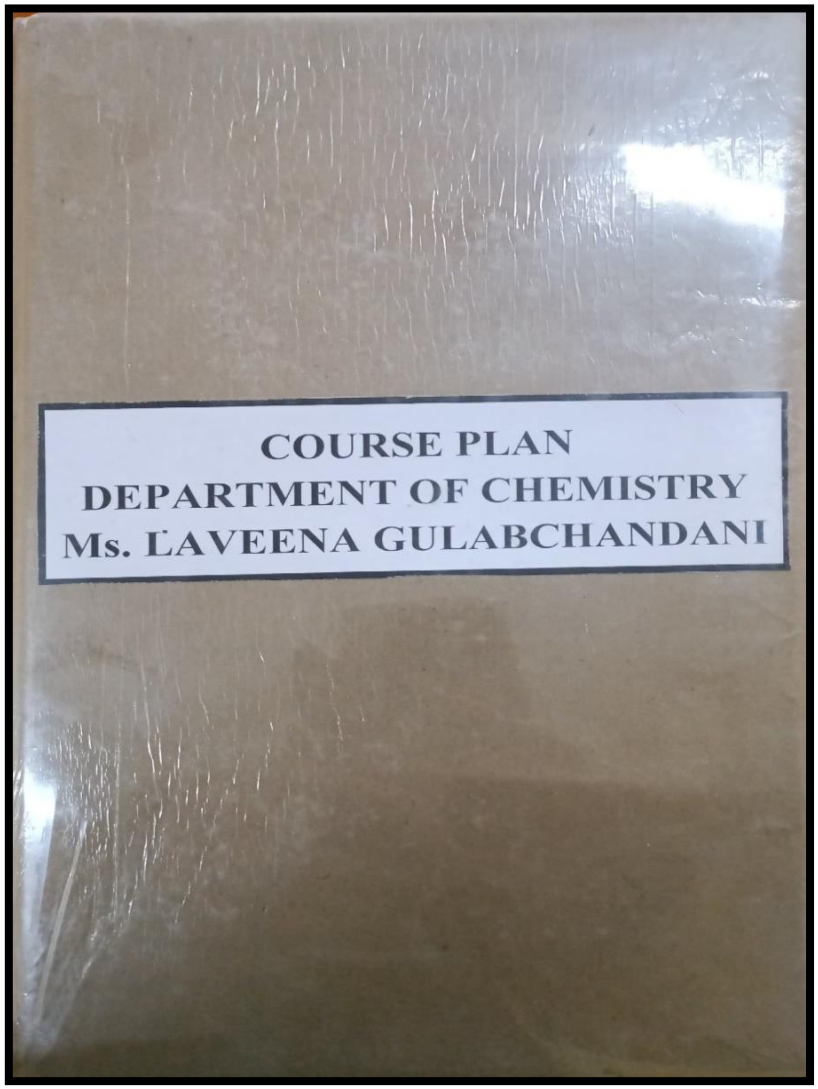

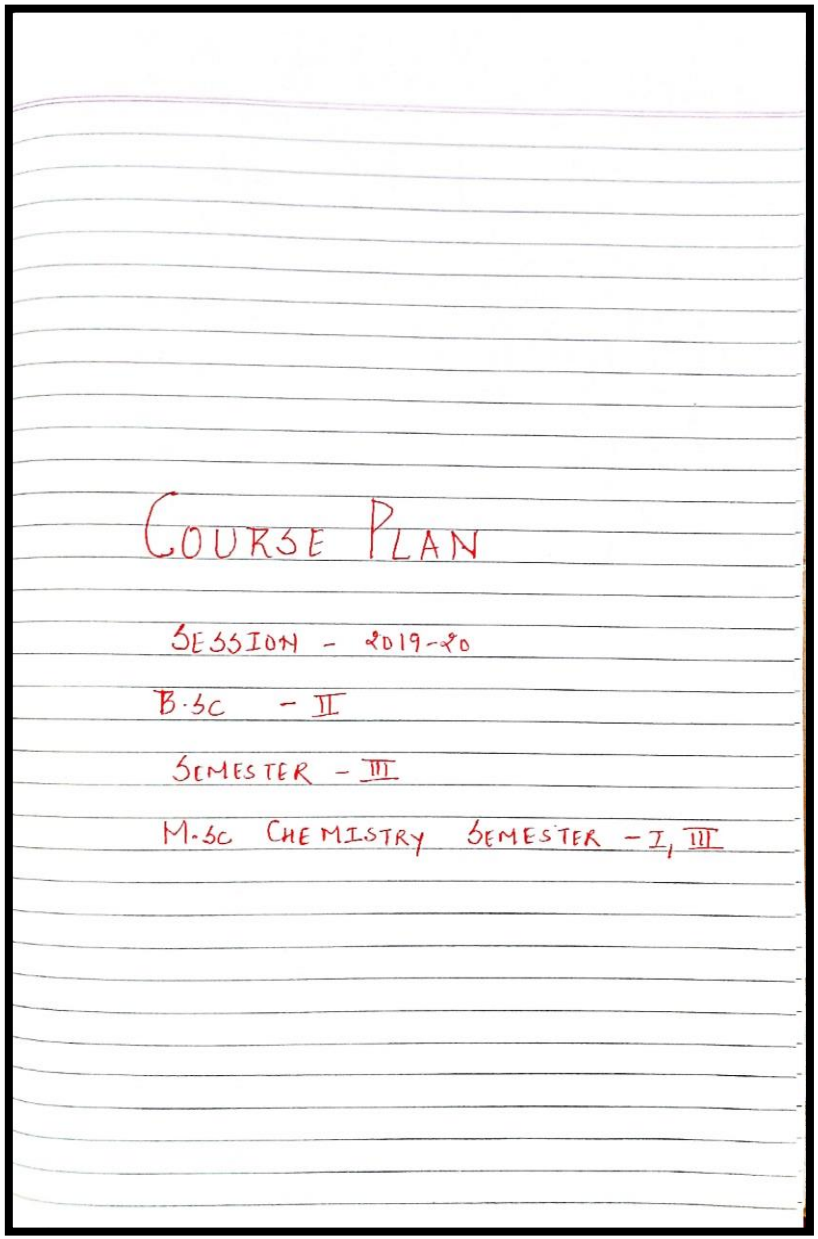
COURSE PLAN
SESSION - 2019-20
B.Sc - II
SEMESTER - III
M.Sc CHEMISTRY SEMESTER - I, III

B.Sc. II (SEMESTER III)

INORGANIC CHEMISTRY (PAPER I) (CHE-301)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext; 10 Int) Credit: 03

COURSE PLAN

SEM III Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	UNIT I **Chemistry of Elements of First Transition Series** Characteristic properties of d-block elements. General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties, ability to form complexes and stability of various oxidation states.	Characteristic properties of first and second transition series	PPT, Flow Charts, Quiz	Assess the chemistry of the first, second and third transition series.	*Knowledge Based* - Which element is radioactive in lanthanide series? - List three ferromagnetic metals. *Understanding Based* - Classify acids and bases according to lewis concept. -Compare ionic radii of 3d and 4d transition series.	Knowledge--50 Understanding-35 Higher Order-15
	Chemistry of Elements of Second and Third Transition series General characteristics, comparative treatment with their 3d-analogues in respect of ionic radii, oxidation states, magnetic behaviour, spectral properties and stereochemistry	Comparative Periodic trends in properties of 3d, 4d and 5d series.	PPT, Demonstration, Flipped Classroom.			

AUGUST	UNIT II **Coordination Compounds** Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes. Inner and outer orbital complexes of Cr, Fe, Co, Ni and Cu (coordination numbers 4 and 6), limitations of VBT	Werner's Theory and VBT	PPT, Models, Group Discussions	Predict chemical properties of Coordination compounds, Lanthanides and Actinides.	*Higher Order Thinking Skills Based* -Justify that tetrahedral complexes are high spin complexes. -Elaborate Werner's theory of coordination compounds.	
	Chemistry of Lanthanides Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, separation of lanthanides (ion-exchange method only).	Extraction and Properties of lanthanides	Flow Charts, Diagrams			
	Chemistry of Actinides General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, similarities between the later actinides and the later lanthanides. Comparison of actinides with lanthanides.	General features of Actinides	Group discussions			
SEPTEMBER-OCTOBER	UNIT III **Acids and Bases** Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and	Classification of Acids and Bases	PPT, Flow Charts	Illustrate oxidation reduction behaviour and		

	Lewis concepts of acids and bases.			aqueous and non aqueous solvents.		
	Non-aqueous Solvents Physical properties of a solvent, types of solvents and their general characteristics reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.	Chemical reactions in non aqueous solvents	Group discussions, Flipped Classroom			
	Oxidation and Reduction Use of redox potential data-analysis of redox cycle, redox stability in water-Frost, Latimer and Pourbaix diagrams. Principles involved in the extraction of the elements.	Redox potential data analysis	Diagrams, Flow Charts			

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.SC CHEMISTRY (PREVIOUS)
SEMESTER I (M.Sc PREV)
PHYSICAL CHEMISTRY- I (CHEM-103)

MAX MARKS: 100(70EXT; 30 INT) **MIN. MARKS: 40(28 EXT;12 INT)**

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	UNIT I Schrodinger equation, harmonic oscillator, the rigid rotor, the hydrogen atom. Applications of variation method and perturbation theory to the Helium atom.	Quantum Chemistry	Demonstration, PPT	-Predict aspects of Quantum Chemistry	*Knowledge Based* -What do you mean by Ionic Strength? Give suitable Example. - Define Activity. *Understanding Based* -Discuss generalized method for	Knowledge--25 Understanding-45 Higher Order-30
	Huckel theory of conjugated systems, bond order and charge density calculations. Applications to ethylene, butadiene, cyclopropenyl radical, cyclobutadiene etc.	Molecular Orbital Theory				
AUGUST	Concept and determination of fugacity Non-ideal	Thermodynamics	PPT , Diagrams	Summarize		

	systems, Excess functions, Activity, Activity coefficient and their determinations, Debye Huckel theory; ionic strength. Application of phase rule to three component system – acetic acid + chloroform + water.			various concepts of thermodynamics and phase rule.	determination of Fugacity? - State Phase rule. *Higher Order Thinking Skills Based*	
SEPTEMBER-OCTOBER	**UNIT III** Collision theory of reaction rates, activated complex theory, ionic reactions, kinetic salt effects, kinetic and thermodynamic control of reactions, methods of determining mechanism, isotope effects. Dynamic chain , photochemical reactions, acid base catalysis, kinetics of enzyme reactions, fast reactions, , dynamics of unimolecular reactions (Lindemann Theory, Hinshelwood Modifications).	Kinetics of various chemical reactions	Diagrams ,Charts	Assess the kinetics of various chemical reactions.	- Explain Lindemann theory of unimolecular reactions. - Elaborate the kinetics of photochemical hydrogen-bromine reaction.	

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.SC CHEMISTRY (FINAL)
SEMESTER III (M.Sc. F)

SPECTROSCOPY (CHEM-301)

MAX. MARKS: 100 (70 EXT; 30 INT) MIN. MARKS: 40 (28 EXT;12 INT)

COURSE PLAN

SEM/ Month	Unit/Topic	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM III JULY	Unit- I Difficulties and solution for recording ^{13}C -NMR spectra, ^{13}C -^{1}H coupling constant-proton coupled and decoupled, ^{13}C spectra- decoupling technique. Chemical shift calculations for alkanes, alkenes, alkynes and aromatic compounds. Nuclear Overhauser Effect, ^{13}C-DEPT Spectra.	Theoretical and practical essence of ^{13}C –NMR Spectroscopy	Diagrams, PPT, Charts.	Analyse various aspects and phenomenon of ^{13}C - NMR spectroscopy	*Knowledge Based* - Why ^{13}C is NMR active while ^{12}C is not? - Define base peak. *Understanding Based* - Compare ^{13}C-NMR and ^{1}H-NMR spectroscopy. -Analyze shielding and deshielding of protons in ^{1}H-NMR.	Knowledge--25 Understanding-45 Higher Order-30

AUGUST	**Unit-II** Introduction, ion production chambers, factors affecting fragmentation, ion analysis abundance. Mass spectral fragmentation, molecular ion peak, metastable peak, Mc Lafferty rearrangement, Nitrogen rule, High Resolution Mass Spectrometry.	Instrumental and spectral aspects of Mass Spectroscopy	Quiz, Diagrams, Models	Elaborate mass spectroscopy	*Higher Order Thinking Skills Based* - Elaborate the use of ^{13}C- spectra in differentiating the primary, secondary and tertiary carbons by DEPT- 45, DEPT-90 and DEPT- 135 spectra. - Explain High Resolution Mass Spectrometry (HRMS) in detail.	
SEPTEMBER -OCTOBER	**Unit-III** UV-Visible, IR, ^{1}H- NMR, ^{13}C-NMR, MASS-interpretation of common organic compounds.	Applications of spectroscopy	PPT, Flow charts	Determine the structure of different organic compounds with the help of spectroscopic data.		

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M.SC CHEMISTRY (FINAL)

Practical (CHEM-305)

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM III JULY	**INORGANIC PREPARATIONS** • Prepare sodium amide • Prepare calcium oxalate • Prepare magnesium oxalate • Prepare sodium tetrathionate $Na_2S_4O_6$ • Prepare vanadyl acetylacetonate Vo $(acac)_2$ • Prepare Fe $(acac)_2$ • Prepare $R_2Sn(acac)_2$ • Prepare $Cr(acac)_2$ • Prepare Cu $(acac)_2 H_2O$ • Prepare $Al(acac)_3$ • Prepare tris (acetyl acetanato) manganese(II) • Prepare Fe (II) chloride • Prepare ferrocene • Prepare copper glycine complex.	Methods of Synthesis of various inorganic compounds	Instruments like pH meter, Glassware, Diagrams	Understand the practical applications of various aspects of chemistry	*Knowledge Based* -- Practical File Work *Understanding Based* -To study the effect of addition of an electrolyte on the solubility of an organic acid. -To separate nad identifify the components of the given organic ternary mixture. *Higher Order Thinking Skills Based* -Viva- Voce	Knowledge--20 Understanding-40 Higher Order-40

SEPTEMBER-OCTOBER	**A. PHYSICAL** • Determine the partial molar volume of solute and solvent in a binary mixture • Study the effect of addition of an electrolyte on the solubility of an organic acid. • Determine the composition of binary mixture containing K2Cr2O7 and KMnO4 using spectrophotometer. • Determine the heat of neutralization of hydrochloric acid by sodium hydroxide. • Determine the heat neutralization of two acids eg HCl and CH3COOH and hence their relative strengths. • Study the adsorption of iodine form alcoholic solution on charcoal • Determine the rate constant of a reaction between acetone and iodine in presence of mineral acid and a catalyst and to show that this reaction is of zero order with respect to iodine. • Verify Beer's law for the solubility and determine the	Use of various instruments like colorimeter, pH meter.	Instruments like pH meter, Glassware, Diagrams	Understand the practical applications of various aspects of chemistry	*Knowledge Based* -- Practical File Work *Understanding Based* -To study the effect of addition of an electrolyte on the solubility of an organic acid *Higher Order Thinking Skills Based* -Viva- Voce	Knowledge--20 Understanding-40 Higher Order-40

	unknown aqueous solution of KMnO4					

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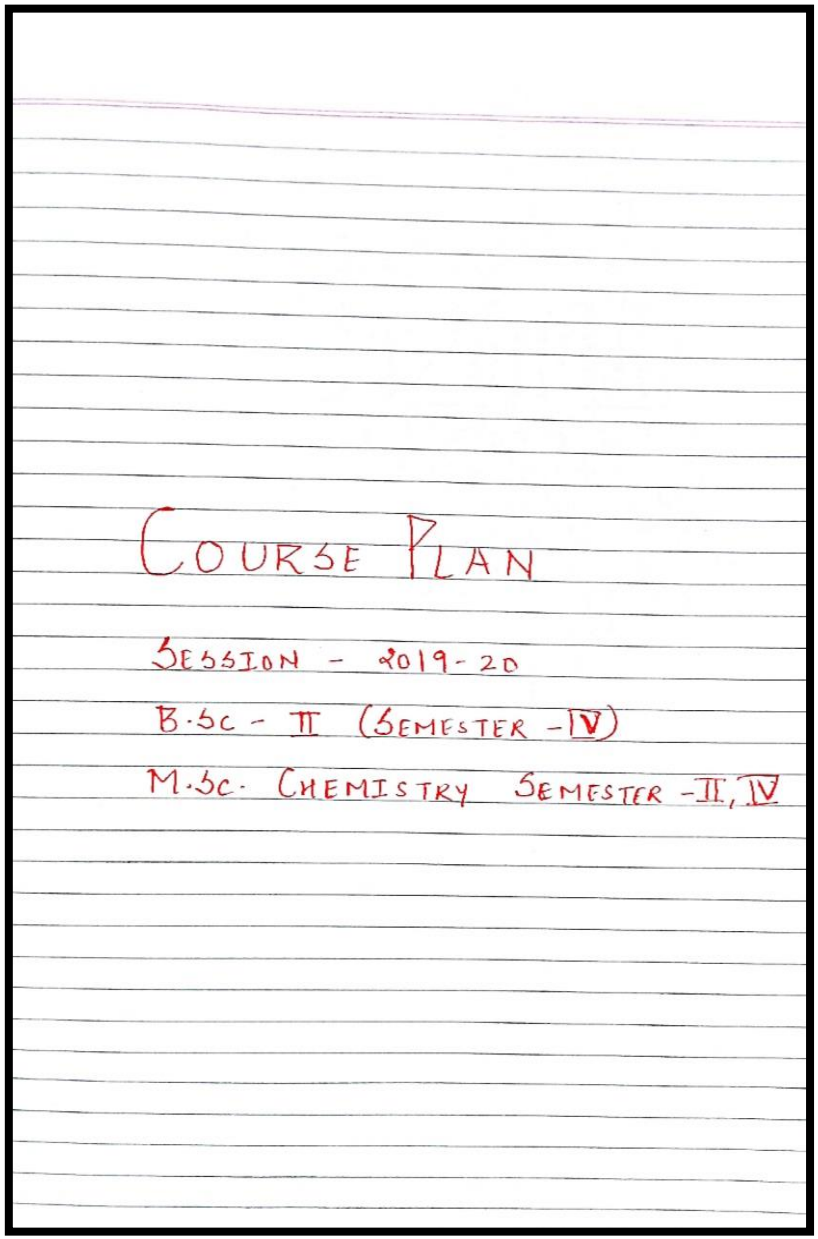
COURSE PLAN
SESSION - 2019-20
B.Sc - II (SEMESTER - IV)
M.Sc. CHEMISTRY SEMESTER - II, IV

B.Sc. II (SEMESTER IV)

PHYSICAL CHEMISTRY (PAPER I) (CHE-401)

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext; 10 Int) Credit: 03

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV DECEMBER-JANUARY	UNIT I **Thermodynamics-I** First Law of Thermodynamics: Statement, internal energy and enthalpy,heat capacities at constant volume and constant pressure and their relationship. Calculation of w, q, dU, & dH for the expansion of ideal gases.	Basic concepts of thermodynamics	PPT, Flow Charts, Quiz	To Compare and apply various concepts of Thermodynamics and electrochemistry	*Knowledge Based* - What is Arrhenius theory? - Define corrosion. *Understanding Based* - Derive Joule Thomson Coefficient. -Give the relationship between Cp and Cv. *Higher Order Thinking Skills Based* - Discuss	Knowledge--50 Understanding-35 Higher Order-15
	Thermochemistry standard state, standard enthalpy of formation-Hess's Law, Heat of reaction at constant pressure and at constant volume, Enthalpy of neutralization, Kirchhoff's equation.	Basic concepts of thermochemistry	PPT, Quiz Demonstration, Flipped Classroom.			
	Thermodynamics-II Second law of thermodynamics, Carnot cycle, Carnot theorem, Concept of entropy: entropy as a	Basic concepts of second and third laws of thermodynamics	Group Discussions, Flipped Classrooms			

	state function, Entropy change in ideal gases and mixing of gases. **Third law of thermodynamics:** Nernst heat theorem, Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, Variation of G with A with P, V and T.				Debye-Huckel-Onsager's equation for strong electrolytes. -Discuss transport number.	
FEBRUARY	UNIT II **Electrochemistry-I** Electrical transport, specific conductance and equivalent conductance and their measurement, Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes, Transport number, Applications of conductivity measurements in determination of degree of dissociation, Ka of acids, solubility product of a sparingly soluble salt, ionic product of water, hydrolysis constant of a salt,	Understanding of various types of conductances and laws	PPT, Models, Group Discussions	To summarize various types of conductances and laws of electrochemistry and their applications.		

	conductometric titrations.					
MARCH -APRIL	UNIT III **Electrochemistry-II** Types of reversible electrodes-gas-metal ion, metal-insoluble salt anion and redox electrodes. Electrode reactions, Nernst equation, standard hydrogen electrode, reference electrodes, standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells-reversible and irreversible cells, conventional representation of electrochemical cells. EMF of a cell and its measurements. Computation of cell EMF. Calculation of thermodynamic quantities of cell reactions, polarization, over potential and hydrogen over voltage. Concentration cell with and without transport, liquid junction potential, application of concentration cells, pH determination using hydrogen electrode and quinhydrone electrode, glass electrode. Potentiometric titrations -	Understanding of various types of electrodes and electrolytic and galvanic cells and their applications and concept of corrosion	PPT, Flow Charts, Models, Group Discussions	Illustrate of various types of cells and application of concentration cells.		

	qualitative treatment (acid-base and oxidation-reduction only). Corrosion- Types, theories & methods of combating it					

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M.Sc. CHEMISTRY (PREVIOUS)
SEMESTER II (M.Sc PREV)
PHYSICAL CHEMISTRY- II (CHEM-203)

MAX MARKS: 100(70EXT; 30 INT) **MIN. MARKS: 40(28 EXT;12 INT)**

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM II DECEMBER-JANUARY	Unit I **Electrochemistry** Electrochemistry of solutions, Debye-Huckel-Onsager treatment and its extension, ion solvent interactions. Debye-Huckel-Bjerrum model. Semiconductor interfaces-theory of double layer at semiconductor, structure of double layer interfaces. Effect of light at, semiconductor solution	Concepts of Electrochemistry, Overpotential and Corrosion	Demonstration, PPT	Explain the electrochemistry.	*Knowledge Based* - Define Polarography. - What are micelles? *Understanding Based* - Discuss Tafel theory of Overpotential. -Describe the	Knowledge--25 Understanding-45 Higher Order-30

	interface. Overpotentials, exchange current density, derivation of Butler-Volmer equation, Tafel Plot. Polarography theory, Ilkovic equation; half wave potential and its significance. Corrosion – Types, mechanism and inhibition.				effect of nature of surfactant on Critical micelle concentration. *Higher Order Thinking Skills Based* - Elaborate the low and high Overpotential cases of Butler-Volmer Equation. - Explain the mechanism of Polymerisation.	
FEBRUARY	**Unit II** **Surface Chemistry** **1. Adsorption** Pressure difference across curved surface (Laplace equation), vapour pressure of droplets (Kelvin equation), Gibbs adsorption isotherm, estimation of surface area (BET equation without derivation), mechanism of surface catalytic reactions.	Phenomenon of adsorption and Micelles	PPT , Diagrams	Summarize the concepts of adsorption and micelles.		

	2. Micelles Surface active agents, classification of surface active agents, micellization, hydrophobic interaction, critical micellar concentration (CMC), factors affecting the CMC of surfactants, counter ion binding to micelles, thermodynamics of micellization, solubilization, micro emulsion, reversemicelles.					
MARCH-APRIL	**Unit III** **Macromolecules:** Polymer- definition, types of polymers, electrically conducting , fire resitant, liquid crystal polymers, kinetics of polymerisation , mechanism of polymerisation. Molecular mass , number and mass average molecular mass,	Mechanism of polymerisation and chain configuration of macromolecules	Diagrams, Charts	Assess the chemistry of macromolecules.		

	molecular mass determination (osmometry, viscometry, diffusion) , sedimentation, chain configuration of macro molecules, calculation of average dimensions of various chain structures.					

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.Sc. CHEMISTRY (FINAL)
GROUP-A INORGANIC CHEMISTRY
SEMESTER IV

SUPRAMOLECUALR CHEMISTRY - CHEM-402(A)

MAX MARKS: 100 (70EXT; 30 INT) **MIN. MARKS: 40 (28 EXT;12 INT)**

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV DECEMBER-JANUARY	**Unit-I** **Introduction-** Definition and development of Supramolecular Chemistry, Classification of Supramolecular Host- Guest Compunds, receptors, Nature of Supramolecular Interactions- Ion-Ion Interactions, Ion-dipole Interactions, Dipole- Dipole interaction, , Hydrogen bonding, Cation- interaction, Anion-interactions, - interactions, vander wall forces and Crystal Close packing, Closed shell Interactions	Supramolecular Host- Guest Chemistry	Diagrams, Flow Charts.	Analyse different aspects of supra molecular chemistry. .	*Knowledge Based* - What [σ ∩ ρ] and [σ /ρ] represents? - Draw a Flow Diagram showing receptor substrate interaction to form molecular and Supramolecular devices. *Understanding Based*	Knowledge--25 Understanding-45 Higher Order-30

	Molecular recognition: Introduction to recognition, information and complementarity, Principle of molecular receptor designs, Spherical recognition, Tetrahedral recognition, Recognition of ammonium ions and neutral molecules, multiple recognition by coreceptor molecules.	Recognition of various substrates by receptors	Diagrams, PPT, Flipped Classrooms		- Summarize proton Coupled transport in a pH gradient. - Explain π- π interactions in Supramolecular Species. *Higher Order Thinking Skills Based* - Elaborate Tetrahedral Recognition.
FEBRUARY	**Unit-II** **Supra molecular reactivity and catalysis**-Introduction, Catalysis by cation , anion and metalloreceptor molecules, catalysis with Cyclophane type receptors, Co catalysi- synthetic reaction catalysis, Bimolecular and abiotic catalysis.	Catalytic aspects of Supermolecular Species.	Diagrams, Flow Charts ,Flipped Classrooms	Assess supramolecular reactivity and catalysis.	- Illustrate catalysis by anion receptor molecules.
	Transport processes and carrier design- carrier mediated transport, cation, anion transport process, coupled transport process, electron coupled, proton coupled and light coupled transport.	Transport processes carried out by Supermolecules.	Diagrams, Demonstration.		

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M.Sc. CHEMISTRY (FINAL)
GROUP-A INORGANIC CHEMISTRY
SEMESTER IV

INORGANIC POLYMERS - CHEM – 403(A)

MAX MARKS: 100 (70EXT; 30 INT) **MIN. MARKS: 40 (28 EXT;12 INT)**

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV DECEMBER-JANUARY	**Unit-I** **Basics Concepts** Definition, Classifications by Connectivities, Classifications by Dimensionality, the Metal/Backbone Classification of Metal-Containing Polymers.	Basic Concepts and Classification and	Diagrams, Flow Charts.	Elaborate basic concepts and synthesis of Inorganic polymers.	*Knowledge Based* Define Inorganic Polymers. - Write Svedberg Equation. *Understanding Based* - Summarize Ebulliometry for	Knowledge--25 Understanding-45 Higher Order-30

	Inorganic Polymer Synthesis Step Growth synthesis, Chain Polymerization, ring opening polymerization, Reductive coupling and other Redox Polymerisation reactions.	Synthesis of Inorganic polymers.	Diagrams, PPT, Flipped Classrooms		determination of molar mass. -Discuss general mechanism of Anion and Radical Ring Opening Polymerization. *Higher Order Thinking Skills Based* - Elaborate Step Addition synthesis of Inorganic Polymers. - Explain Preparation and properties of Silicones	
FEBRUARY	**Unit-II** **Inorganic Polymer Characterization** Average Molecular Masses and Degrees of Polymerization, Methods of Characterizing Average Molecular Masses- Gel Permeation Chromatography, Viscosity, Universal Calibration, Colligative Properties (Vapor Pressure Lowering, Boiling Point Elevation, Melting Point Lowering, and Osmotic Pressure), End-Group Analysis, Mass Spectroscopy,	Determination of molecular weight of Inorganic Polymers	Diagrams, Flow Charts ,Flipped Classrooms	Analyse the Chemical nature of polymers		

	Ultracentrifugation.					
	Analysis and. testing of polymers Chemical analysis of polymers, spectroscopic methods. X-ray diffraction study, microscopy. thermal analysis and physical testing-tensile strength. Fatigue, impact, tear resistance. hardness and abrasion resistance.	analysis of polymers.	Diagrams, Demonstration.			
MARCH-APRIL	**Unit-III** **Polymers based on Boron –** Borides, Carborane Polymers, Borazine, Boron Nitride	Chemistry of Boron polymers	PPT, Diagrams, Demonstration.	Summarize the Properties of Inorganic Polymers.		
	Polymers based on Silicon-Silicones- Preparation and properties of Silicones, Silicone Fluids, Silicone Rubbers, Silicone Resins, Modification of Silicones **Polysilanes and related polymers-** Structure, Synthesis, Physical and electronic properties of polysilanes, Chemical modification of Polysilanes, Other Silicon Containing Polymers	Preparation, properties and structure of Silicon Polymers	Group Discussion, Diagrams			

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.SC CHEMISTRY (FINAL)
PRACTICALS (CHEM-405) (FOR GROUP –A,B,C)

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM III JULY	**INORGANIC CHEMISTRY** **Chromatographic Separations (Any Three)** • Cadmium and Zinc. • Zinc and Magnesium • Separation and identification of the sugars present in the given mixture of glucose, fructose and sucrose by paper Chromatography and determination of R_f values. • Separation and identification of Pb and Cd by Paper Chromatography and determination of R_f values.	Separation of mixtures of metal ions	Demonstration of the Exercise	Understand the practical applications of various aspects of chemistry	*Knowledge Based* -- Practical File Work *Understanding Based* -To Separate and identify of Pb and Cd by Paper Chromatography and determination of R_f values. -To Isolate of caffeine from tea leaves. *Higher Order Thinking Skills Based* -Viva- Voce	Knowledge--20 Understanding-40 Higher Order-40

AUGUST	**ORGANIC CHEMISTRY** **Extraction of organic compound from natural source** • Isolation of caffeine from tea leaves. • Isolation of casein from milk • Isolation of lactose from milk • Isolation of piperine from black pepper. • Isolation of lycopene from tomatoes. • Isolation of -carotene from carrots. **Spectroscopy** • Identification of organic compounds by the analysis of their spectral data (UV, IR, PMR).	Extraction and Spectroscopic determination of Organic Compounds	Spectra, Use of glassware like separating funnel and Distillation assembly			
SEPTEMBER-OCTOBER	**PHYSICAL CHEMISTRY** • Determination of pKa of indicator (e.g. Phenolpthalein). • Determination of stoichiometry and stability constant of inorganic (e.g.ferric-salicyclic acid) organic	Instrumentation	Exercises with Use of different Apparatus, instruments like pH meter, conductivity meter			

	(e.g. amine and iodine) complexes. • Characterisation of complexes by electronic and IR spectral data. • To obtain solubility curve for a ternary system of liquids, water-acetic acid, acid-chloroform system. • To estimate oxalic acid by carrying out suitable conductometric titration in the following solutions. i. A solution of pure Oxalic acid. ii. A solution of Oxalic acid and HCl. iii. A solution of Oxalic acid and CH_3COOH					

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