

Pt. J.L.N. Govt. P.G. College, Faridabad-121002

Department of Chemistry

Academic Session 2025-26, wef 15.07.25

Lesson Plan - Odd Semester

Dr. Ankita, Assistant Professor Chemistry

Month	Week	BSc-I Chem Hons SEC	BSc-III BT IC	MSc I Chem IC	
July	3	Experimental techniques	Metal-Ligand Bonding in Transition Metal Complexes	Admissions	
	4				
	5				
August	1			Assignment	Metal-Ligand Bonding
	2				
	3				
	4				
	5		Thermodynamic & Kinetic Aspects of Metal complexes	Reaction Mechanism of Octahedral Transition Metal Complexes-I Assignment & Seminar	
September	1	Analysis of soil & water			Assignments & Seminar
	2				
	3				
	4	Pesticides Test 01 Chemistry in Cosmetics Revision Test 02	Magnetic properties of Transition metal complexes Test	Reaction Mechanism of Square planar Transition Metal Complexes-II Test Isopoly and Heteropoly Acids and Salts of Mo & W	
October	1				
	2				
	3 (Diwali Vacation)				
	4				
	5				
November	1		Electronic spectra of transition metal complexes Revision	Crystal Structures	
	2				
	3				
	4				
	5	Exam from 19.11.25		Revision	

**Govt. College, Faridabad, Department of
Chemistry
Academic Session 2025-26
Lesson Plan - Odd Semester
Dr. Kiran Devi Poonia, Extension Lecturer,
Chemistry**

Month	MSc II (Inorganic Chemistry Special III)	BSc III (H)	BSc III M (A&B)
July	----	Metal ligand bonding in transition metal complexes introduction,	Metal-ligand Bonding in Transition Metal
August	Metalloenzymes- Structure and functions Zinc Enzymes: Carboxypeptidase and carbonic anhydrase. Iron Enzymes: Catalase, peroxidase and cytochrome P-450.	Limitation of VBT, CFT, Factors affecting crystal field parameters,	Limitation of VBT, CFT, Factors affecting crystal field parameters,
September	Copper Enzymes: Superoxide dismutase, non-blue copper proteins: cytochrome c oxidase and galactose oxidase. Coenzymes: Vitamin B ₁₂ , functions of coenzyme B ₁₂ . Molybdenum Enzymes: Xanthine oxidase and aldehyde oxidase	Electronic spectra of transition metal complexes,	Thermodynamic and Kinetic aspects of transition metal complexes
October	Oxygen carriers and storage systems: Porphyrins, Metalloporphyrins, comparison of spectral properties of porphyrins and metalloporphyrins, heme-proteins, structure and functions of haemoglobin (Hb) and myoglobin (Mb), synthetic oxygen carrier model systems, Perutz mechanism for cooperativity in hemoglobin, role of protein chain in Hb, factors affecting binding powers of O ₂ with Hb and Mb (Effect of partial pressure of O ₂ and effect of pH/Bohr's effect), role of 2,3-bisphosphoglycerate in the functioning of Hb.	Thermodynamic and Kinetic aspects of transition metal complexes Acids and Bases, HSAB concept, Silicones and Phosphazenes.	Magnetic Properties of Transition Metal Complexes
November	Metal transport and storage: Iron-storage: Ferritin, iron-transport: transferrin & siderophores, copper transfer: ceruloplasmin.	Magnetic Properties of Transition Metal Complexes Revision	Electron Spectra of Transition Metal Complexes Revision
December	Alkali and alkaline earth metals in biological systems: Ionophores, active transport of cations across membranes, sodium pump, calcium pump, calcium carriers, role of carriers in muscle contraction, blood clotting hormones.		

**Govt. College, Faridabad, Department of
Chemistry
Academic Session 2025-26
Lesson Plan - Odd Semester
Dr.Priyanka Naruka, Extension Lecturer,
Chemistry**

Month	BSc 3rd sem Major Chemistry	BSc 1st sem minor Chemistry	BSc 3sem SEC
July	Chemical of Transition series Elements	Atomic structure	Battery
August	Thermodynamic introduction, laws of Periodic properties Thermodynamic, Entropy changes		Primary Battery Assignment
September	Electrochemistry Unit test 1	Mole concept Unit test 1	Primary Battery Unit test 1
October	Alkyl Halides Assignment and Unit test 2	Fundamental chemistry Assignment and unit test 2	Secondary Battery organic Unit test 2
November	Aryl Halides Revisions	GOC Revision	Secondary Battery Revision Seminar
December	Exam	Exam	Exam

Department of Chemistry
Academic Session 2025-26, wef 15.07.25

Lesson Plan - Odd Semester
Dr. Suman Rani, Extension Lecture Chemistry

Month	Week	BSc-I Chem Hons DSC-I	BSc-II Hons DSC-III	MSc II Chem IC
July	3	Atomic structure and periodicity of elements	Bioinorganic-I Assignment	Admissions
	4			
	5			
August	1			
	2			Nuclear binding energy and nuclear structure Assignment & Seminar
	3			
	4		System of variable composition	
	5	Ionic solids Assignments & Seminar		
September	1			
	2			
	3			
	4	Gaseous state-I Test 01 Revision Test 02	Alcohols Test	Nuclear reactions and nuclear fission Test Detection of nuclear reactions
October	1			
	2			
	3 (Diwali Vacation)			
	4			
	5		Phenol, Ether and Epoxides	
November	1			Radiochemical Technique
	2			
	3		Revision	
	4			Revision
	5	Exam from 19.11.25		

Lesson Plan - Odd Semester

Mrs. Neetu Malik, Extension Lecture Chemistry

Month	Week	BSc-III Hons Paper-I	BSc-III Hons Paper-II	BSc-III M
July	3	Solution and colligative properties	Statistical thermodynamics Assignment	Quantum Mechanics
	4			
	5			
August	1			
	2			Physical property and molecular structure Assignment & Seminar
	3			
	4		Nuclear chemistry and radioactivity	
	5	Rotational spectroscopy Assignments & Seminar		
September	1			
	2			
	3			
	4	Phase equilibrium Test 01 Photochemistry Revision Test 02	Polymer chemistry Test	Basics feature of spectroscopy and rotational spectroscopy Test
October	1			
	2			
	3 (Diwali Vacation)			
	4			
	5		Physical properties and molecular structure	
November	1			Vibrational and raman spectroscopy
	2			
	3		Revision	
	4			Revision
	5	Exam from 19.11.25		

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Department of Chemistry

Academic Session 2025-26, wef 15.07.25

Lesson Plan - Odd Semester

Dr. Manju Rani (Extension Lecturer)

Month	Week	BSc-II MDC	BSc-II minor	MSc II chem
July	3	Chemical bonding- Types of bonding, covalent bond, ionic bond , co-ordinate bond , hydrogen bond, van der waals interactions, valence bond theory, VESPER theory, concept of hybridization and shapes of molecules, molecular orbital theory	Metals and nonmetals – occurrence of elements in nature, physical and chemical properties of metal and nonmetal, minerals and ores, metallurgy process, refining of metal, metallurgy of Al, Zn, Cu and Fe.	Vibrational spectroscopy
	4			
	5			
August	1	Basic principles of organic chemistry – Types of organic reactions, electrophile and nucleophile, homolytic and heterolytic fission of covalent bond, inductive effect, electrometric effect	Solutions – types of solutions , expression of conc. of solutions of solids in liquids, solubility of solids in gases, Raoult's law, colligative properties , determination of molecular masses by colligative properties, abnormal molecular masses , van hoff factor	Electron spin resonance spectroscopy
	2			
	3			
	4			
September	5	Corrosion – Introduction and causes of corrosion, types of	Hydrocarbons- Alkanes- general methods of preparation and	Mossbauer spectroscopy Mass Spectroscopy
	1			
	2			

October	3 (Diwali Vacation)	corrosion,dry and wet corrosion, factors affecting corrosion, methods to prevent corrosion Biomolecules- classification of carbohydrates, structure and importance of monosaccharides, importance of disaccharides and polysaccharides Proteins- amino acids, peptide linkage, primary secondary tertiary and quaternary structure of proteins denaturation of proteins,nucleic acids	reactions,free radical substitution Alkenes- general methods of preparation and reactions,cis addition,trans addition, addition of HX, hydrolysis, ozonolysis,oxymercuration-demercuration,hydroboration oxidation Alkynes- general methods of preparation, reactions, formation of metal acetalides, acidity of alkynes-, ozonolysis Aromatic hydrocarbons – Structure of benzene,methods of preparation, reactions,	
	4			
	5		Electrophilic substitution reaction ,nitration,halogenation,sulphonation.	
November	1			Nuclear magnetic resonance spectroscopy
	2			
	3			
	4			Revision
	5			

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Department of Chemistry

Academic Session 2025-26, w.e.f. 15.07.25

Lesson Plan - Odd Semester

Mrs. Nisha Tewatia, Extension Lecturer, Chemistry

Month	Week	BSc-III Chem Hons (Org. Chem-I; CH (H) - 505	MSc II (Org. Chem-II) (Natural Products- 25CHE203DS06)	BSc-III Chem Hons (Org. Chem-II; CH (H) -506)
July	3	Carbohydrates: Monosaccharides, Structures of ribose and deoxyribose, disaccharides	Structure and synthesis of vitamins A, B1, B2, B6, C, D, E, nicotinic acid, pantothenic acid and biotin. Assignment	Heterocyclic Compounds: pyrrole, furan, thiophene, and pyridine, indole, quinoline, and isoquinoline
	4			
	5			
August	1			
	2			
	3			
	4			
	5	Nuclear magnetic resonance, Mass Spectroscopy Assignment		
September	1		Enzymes and co- enzymes, Enzyme- catalyzed reactions, Co- enzymes	
	2			
	3			
	4	Organosulphur Compounds Test 01 Organozinc Organolithium Organo lead Organo cadmium Organo copper compounds Revision Test 02		
October	1		Flavone, chrysin, flavonol, quercetin, diadazin, xanthone, euxanthone, cyanidin chloride, malvidin chloride, hirsudin chloride. Biosynthesis of flavonoids. Test	Amino Acids, Peptides, Proteins and Nucleic Acids Test Organo Phosphorus Compounds
	2			
	3 (Diwal i Vacati on)			
	4			
	5			
November	1			
	2			
	3	Revision		
	5		Exam from 19.11.25	

Pt. J.L.N. Govt. P.G. College, Faridabad
Academic Session 2025-26
Lesson Plan - Odd Semester
Dr. Durgesh Gautam, Extension Lecturer,
Department of Chemistry

Month	Week	BSc-I Chem Hons DSC 2	BSc-III Med Organic Chemistry	BSc-I Chem Hons SEC	B Sc 1 Minor
July	3	Chemical Bonding	Nuclear Magnetic Resonance Spectroscopy -I Assignment	Analysis of Soil and water	Atomic Structure
	4				
	5				
August	1	Gaseous State & Liquid State			
	2				
	3				
	4		Nuclear Magnetic Resonance Spectroscopy - II	Chemistry in Cosmetics Assignments & Seminar	
	5	Alkanes and Alkenes Assignments & Seminar			Periodic Table & atomic Properties
September	1				
	2				
	3				
	4	Dienes, Alkynes Test 01 Aromatic Hydrocarbon Revision Test 02	Carbohydrates Test	Pesticides Test 01 Experimental Techniques Revision Test 02	Mole Concept Fundamentals of organic Chemistry Revision
October	1				
	2				
	3 (Diwali Vacation)				
	4				
	5		Organometallics		

Lesson Plan
SEMESTER- I

Name of Program	B.Sc. (Chemistry as Single Major)	Program Code	USCHE4
Paper No.	SEC Paper – III	Course Code	25CHE403SE01
Name of the Course	Skill Enhancement Course	Maximum Marks	50
Nomenclature	Batteries	Credits & Hours per Week	02 & 02
Note: The Formative Assessment Criteria for this Course as Follows: Written test (2x10) :20 Assignment/Case Study/Mini Project (2x10) :20 Seminar/Presentation :10 Total :50			

Month	1st Week	2nd Week	3rd Week	4th Week
July	-	-	Components of cells and batteries.	classification of cells and batteries.

August	operation of a cell, theoretical cell voltage.	capacity, and energy, specific energy and energy density of practical batteries.	designing to eliminate potential safety problems, battery safeguards when using discrete batteries.	battery construction, design of rechargeable batteries, factors affecting battery performance.
September	General characteristics and applications of primary batteries, types and characteristics of primary batteries	Comparison of the performance characteristics of primary battery systems, recharging primary batteries.	Zinc-Carbon Batteries (Leclanche' and Zinc Chloride Cell Systems) General characteristics, cell chemistry, types of cells and batteries, construction, cell components	Magnesium and Aluminum Batteries General characteristics, cell chemistry, construction of Mg/MnO ₂ batteries, performance characteristics of Mg/MnO ₂ batteries.
October	Sizes and types of Mg/MnO ₂ batteries, other types of magnesium primary batteries.	General characteristics and applications of secondary batteries.	Vacation	types and characteristics of secondary batteries. Comparison of performance characteristics for secondary battery systems
November	introduction, chemistry, construction, performance characteristics, charging characteristics of	Introduction, chemistry, construction, performance characteristics, charging characteristics of following batteries: Nickel-Metal	Exam	

	following batteries: Lead batteries, Li- batteries, Iron electrode batteries, Nickel-Cadmium.	hydride, batteries.	Nickel-Zinc	
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Books Recommended/References:

1. Understanding Batteries by R. M. Dell and D. A. J.
2. The TAB Battery Book: An In-Depth Guide to Construction, Design and Use by M. Root.
3. Fuel Cell- Principles and Applications by M. A. Scibioh and B. Vishwanathan.
4. Energy Storage Systems – Batteries and their Chemistry by M. Cultu.

Date: 10/September/2025

Amit

(Amit)

Assistant Professor
Department of Chemistry
G.C. FBD

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Lesson Plan
Semester — III (Session: 2025- 26)

Name of Program	B.Sc. (Chemistry as Single Major)	Program Code	USCHE4
Paper No.	Paper-V	Nomenclature	General Chemistry-V
Name of the Course	Discipline Specific Course	Course Code	25CHES403DS01
Credits	02	Maximum Marks	50
Hours per Week	02	External Marks	35
Duration of Examination	02 Hrs.	Internal Marks	15

Month	1 st Week	2 nd Week	3 rd Week	4 th Week
July	-	-	Metal ions present in biological system, classification based on action (essential, non-essential, trace, toxic)	biological role of Na ⁺ , K ⁺ , Ca ²⁺ , Mg ²⁺ , Fe ²⁺ ions, ionophores, active transport of cations across membrane, Na/K-pump.
August	Vitamin B12, carboxypeptidase A and chlorophyll (w.r.t. photosynthesis).	Partial molar quantities, dependence of thermodynamic parameters on composition	Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases	Clausius-Clapeyron equation and its applications to solid, liquid, liquid-vapour and solid-vapour equilibria.

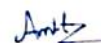
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September	Alcohols: Classification and nomenclature. Monohydric Alcohols: Nomenclature,	Methods of preparation by reduction of aldehydes.	Industrial manufacture of methanol (from CO and H ₂) and ethanol (flow sheet diagram). Dihydric Alcohols: Nomenclature	Methods of preparation, chemical reactions of vicinal glycols, oxidative cleavage (PbOAc ₄ and HIO ₄) and pinacol-pinacolone rearrangement. Trihydric Alcohols
October	Chemical reactions of glycerol. Phenols: Preparation and properties, acidity and affecting factors, ring substitution reactions.	Reimer-Tiemann and Kolbe's-Schmidt reactions, Fries and Claisen rearrangements and their mechanism.	Vacation	Ethers: Methods of preparation, physical properties and chemical reactions.
November	Synthesis of epoxides, acid and base-catalyzed ring opening of epoxides.	Orientation of epoxide ring opening, reactions of Grignard and organolithium.	Exam	

Books Recommended/References:

1. Inorganic Chemistry- Principles of Structure and Reactivity by J.E. Huheey, E.A. Keiter, R.L. Keiter and O. K. Medhi.
2. Physical Chemistry by P.W. Atkins.
3. A Textbook of Physical Chemistry by K.L. Kapoor (Vol-2)
4. A Textbook of Physical Chemistry by K.L. Kapoor (Vol-3)
5. A Guide Book to Mechanism in Organic Chemistry by P. Sykes.
6. Organic Chemistry by R.T. Morrison and R. N. Boyd.
7. Organic Chemistry by I.L. Finar.
8. Organic Chemistry by T.W.G. Solomons.

Date: 10/September/2025



(Amit)

Assistant Professor
Department of Chemistry
G.C. FBD

Lesson Plan

Semester: I

Name of Program	MSc Chemistry	Program Code	CHE2
Paper No.	II	Course Code	24CHE201DS02
Name of the Course	Physical Chemistry-I	Nomenclature	Quantum, Thermodynamics and Electrochemistry
Hours per Week	04	Credits	04
Maximum Marks	100	Time of Examination	03 Hrs
External	70	Internal	30

Month	1 st Week	2 nd Week	3 rd Week	4 th Week
August	Elementary idea of quantum mechanics, Schrodinger wave equation for a particle in one Dimensional box and its pictorial representation.	Schrodinger wave equation for a particle in a three dimensional box, concept of degeneracy, Schrodinger wave equation for a linear harmonic oscillator & its solution by polynomial method	Zero point energy of a particle possessing harmonic motion. Schrodinger wave equation for three dimensional rigid rotator, energy of rigid rotator.	space quantization. Schrodinger wave equation for hydrogen atom, separation of variable in polar spherical coordinates and its solution.
September	Introduction to laws of thermodynamics, Law of mass action and its thermodynamic Derivation.	Classius-Clapeyron equation and its applications. Phase diagram for two completely miscible	Eutectic systems, calculation of eutectic point, systems forming solid compounds	Phase diagram and thermodynamic treatment of solid solutions.

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		components system	AxBy with congruent and incongruent melting points	
October	Rate law for consecutive & parallel reactions (first order). ionic reactions: single and double sphere models, influence of solvent and ionic strength, chain reactions:	ortho-para hydrogen conversion, chain length, apparent activation energy of chain reactions. Photochemical reactions (hydrogen-bromine & hydrogen-chlorine reactions). Rice-Herzfeld mechanism of organic molecules decomposition (ethane, acetaldehyde)	Vacation	Enzyme kinetics, Michaelis-Menton treatment, Lineweaver-Burk plot and Eadie-Hofsteemethods. Competitive and noncompetitive inhibition.
November	Debye-Huckel theory of ion-ion interaction and activity coefficient, applicability and limitations of Debye-Huckel limiting law, its modification for finite-sized ions, effect of ion-solvent interaction on activity coefficient.	Debye-Huckel-Onsager treatment for aqueous solution and its limitations, Debye-Huckel Onsager theory for non-aqueous solutions, solvent effect on the mobility at infinite dilution, equivalent	effect of ion association upon conductivity (Debye-Huckel-Bjerrum equation), Ionic movement under the influence of an electric field, mobility of ions, ionic drift velocity and its relation with current density,	Einstein relation between absolute mobility and diffusion coefficient, Stokes-Einstein relation, Nernst-Einstein equation, Walden's rule.

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