Lesson Plan

Name of Assistant/Associate Prof. : Chiranjiv Tayal
Class & Section : B.Sc. 1st Semester
Subject : Chemistry
Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	• Atomic Structure Dual behavior of Matter and Radiation, de Broglie's relation, Heisenberg's Uncertainty Principle, Concept of atomic orbitals, Significance of quantum numbers,
29.07.2022 to 03.08.2022	• Radial and Angular wave functions, Normal and orthogonal wave functions, Significance of and 2, shapes of s, p, d, and f orbital, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.
05.08.2024 to 10.08.2024	Periodic Table and Atomic Properties • Classification of periodic table, Definition of Atomic and Ionic radii, Ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements).
12.08.2024 to 17.08.2024	• Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.Group discussion & Test.
19.08.2024 to 24.08.2024	Gaseous State • Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most probable velocity.
26.08.2024 to 31.08.2024	• Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behavior, Derivation of Van der Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor)
02.09.2024 to 07.09.2024	Critical Phenomenon • Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Van der Waal's constants (Derivation excluded).Group discussion & Test.
09.09.2024 to 14.09.2024	Structure and Bonding • Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.

16.09.2024 to 21.09.2024	Mechanism of Organic Reactions • Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition.
23.09.2024 to 28.09.2024	• Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reaction intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability).
30.09.2024 to 05.10.2024	• Reaction intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability. Group Discussion & Test. •
07.10.2024 to 12.10.2024	Liquid State • Structure of liquids, Properties of liquids: Surface tension; Refractive index, viscosity, vapor pressure and optical rotation.
14.10.2024 to 19.10.2024	Solid State • Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements.
21.10.2024 to 26.10.2024	• Seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method.
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 09.11.2024	• Revision of Atomic Structure & Periodic properties
11.11.2024 to 16.11.2024	• Revision of Gaseous State ,Structure and bonding and Mechanism of Organic Reaction.
18-11-2024 to 23-11-2024	• Revision of solid and liquid state.

Chiranjiv Gayal
Dept. of Chemistry
GCW, Narnaul

Lesson Plan

Name of Assistant/Associate Prof. : Chiranjiv Tayal
Class & Section : B.Sc. 5th Semester
Subject : Chemistry
Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	• **NMR Spectroscopy-I** Principle of nuclear magnetic resonance, the PMR spectrum,number of signals, peak areas, equivalent and nonequivalent protons positions of signals
29.07.2022 to 03.08.2022	• Chemical shift,shielding and deshielding of protons, proton counting,splitting of signals and coupling constants, magnetic equivalence of protons.
05.08.2024 to 10.08.2024	• **NMR Spectroscopy-II** Discuss ion of PMR spectra of the molecules: ethyl bromide, npropyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone.
12.08.2024 to 17.08.2024	• Simple problems on PMR spectroscopy for structure determination of organic compounds . Test of NMR
19.08.2024 to 24.08.2024	• **Carbohydrates-I** Classification and nomenclature. Monosaccharides, mechanism of osazone formation, inte rconversion of glucose and fructose, chain lengthening and chain shortening of aldoses.
26.08.2024 to 31.08.2024	• Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose in to mannose. Formation of glycos ides, ethers and esters. Determination of ring size of glucose and fructose.
02.09.2024 to 07.09.2024	• Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism ofmutarotation. Structures of ribose and deoxyribose. Group Discussion in Class.
09.09.2024 to 14.09.2024	• **Carbohydrates-II** An introduc tion to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.
16.09.2024 to 21.09.2024	• **Organometallic Compounds** Organomagnesium compounds: the Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions. Test,Seminar& Group Discussion in Class
23.09.2024 to 28.09.2024	• Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions. Test & Group Discussion in Class
30.09.2024 to 05.10.2024	• **Spectroscopy-I** Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Bornoppenheimer approximation, Degrees of freedom.
07.10.2024 to 12.10.2024	• **Rotational Spectrum** Diatomic molecules. Energy levels of rigid rotator (semi-classical principles), selection rules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution).

14.10.2024 to 19.10.2024	• Determination of bond length, qualitative description of non-rigid rotor, isotope effect **Spectroscopy-II** Vibrational spectrum Infrared spectrum: Energy levels of simple harmonic oscillator
21.10.2024 to 26.10.2024	• Selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effects of anharmonic motion and isotopic effect on the spectra., idea of vibrational frequencies of different functional groups. Test & Group Discussion in Class
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 09.11.2024	• **Raman Spectrum**: Concept of polarizibility, pure rotational and pure vibrational Raman spectra of diatomic molecules, selectin rules, Quantum theory of Raman spectra. Revision of Syllabus.
11.11.2024 to 16.11.2024	• Revision of Syllabus
18-11-2024 to 23-11-2024	• Revision of Syllabus

Chiranjiv Tayal
Dept. of Chemistry
GCW, Narnaul

Lesson Plan

Name of Assistant/Associate Prof. : Dr. Deepika Rana

Class & Section : B.Sc(N.Med) 3rd Semester

Subject : Chemistry

Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	**Inorganic Chemistry**-Chemistry of Elements of Ist transition series: Definition of transition elements, position in the periodic table, General characteristics & properites of Ist transition elements
29.07.2024 to 03.08.2024	Structures & properties of some compounds of transition elements – TiO_2, $VOCl_2$, $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$.
05.08.2024 to 10.08.2024	Chemistry of Elements of IInd & IIIrd transition series General characteristics and properties of the IInd and IIIrd trans ition elements
12.08.2024 to 17.08.2024	Comparison of properties of 3d elements with 4d & 5d elements with reference only to ionic radii, oxidation state, magnetic and Spectral properties and stereochemistry.
19.08.2024 to 24.08.2024	**Organic Chemistry**-Alcohols Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters.
26.08.2024 to 31.08.2024	Hydrogen bonding. Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation.
02.09.2024 to 07.09.2024	Chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$ and HIO_4] and pinacol-pinacolone rearrangement. Epoxides Synthesis of epoxides.
09.09.2024 to 14.09.2024	Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides.
16.09.2024 to 21.09.2024	Phenols Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.
23.09.2024 to 28.09.2024	Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction
30.09.2024 to 05.10.2024	Kolbe's reaction and Schotten and Baumann reactions Ultraviole t (UV) absorption spectroscopy

07.10.2024 to 12.10.2024	Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts
14.10.2024 to 19.10.2024	UV spectra of conjugated enes and enones,Woodward- Fieser rules, calculation of max of simple conjugated dienes .
21.10.2024 to 26.10.2024	Carboxylic Acids & Acid Derivatives Nomenclatu re of Carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids
27.10.2024 to 03.11.2024	**Diwali Vacation**
04.11.2024 to 09.11.2024	Effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids.
11.11.2024 to 16.11.2024	Mechanism of decarboxylation. Structure , nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides. Relative s tability o f acyl derivatives
18-11-2024 to 23-11-2024	Revision of Syllabus

Dr.Deepika Rana
Dept. of Chemistry
GCW, Narnaul.

Lesson Plan

Name of Assistant/Associate Prof. : Dr. Deepika Rana
Class & Section : B.Sc. 5th Semester
Subject : Chemistry
Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	• Metal-ligand Bonding in Transition Metal Complexes Limitations of valence bond theory, an elementary idea of cr ystal-f ield theory, crystal field split ting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-f ield parameters.
29.07.2022 to 03.08.2022	• Thermodynamic and Kinetic Aspects of Metal Complexe A brief outline of thermodynamic stability of metal complexes and factors affec ting the s tab ility, substitution reac tions of square planar complexes of Pt(II).
05.08.2024 to 10.08.2024	• Magnetic Properties of Transition Metal Complexe Types of magnetic behaviour, methods of determining magnetic susceptibility.
12.08.2024 to 17.08.2024	• Spin-only formula. L-S coupling, correlation of s and eff values, orbital contribution to magnetic moments, application of magnetic moment data for 3dmetal complexes.
19.08.2024 to 24.08.2024	• Electron Spectra of Transition Metal Complexes Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series.
26.08.2024 to 31.08.2024	• Orgel-energy level diagram for d1 and d9 states, discussion of the electronic spectrum of [Ti(H2O)6]3+ complex ion . Test & Group Discussion.
02.09.2024 to 07.09.2024	• Quantum Mechanics-I Black-body radiation, Plank's radiation law, photoelectric effect, heat capacity of solids.
09.09.2024 to 14.09.2024	• Compton effect,wave function and its significance . Postulates of quantum mechanics , quantum mechanical operator.
16.09.2024 to 21.09.2024	• Commutation relations, Hamiltonial operator, Hermitian operator, average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics,
23.09.2024 to 28.09.2024	• To show quantum mechanically that position and momentum cannot be predicated simultaneously, Determination of wave function & energy of a partic le in one dimensional box, Pictorial representation and its significance.
30.09.2024 to 05.10.2024	• Physical Properties and Molecular Structure Optical activity, polarization – (clausius – Mossotti equation).
07.10.2024 to 12.10.2024	• Orientation of dipoles in an electric field, dipole moment, included dipole moment, measurement of dipole moment-temperature method
14.10.2024 to 19.10.2024	• Refractivity method, dipole moment and structure of molecules. Test & Group discussion.

21.10.2024 to 25.10.2024	• Magnetic permeability, magnetic susceptibility and its determination. Applica tion of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics.
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 09.11.2024	• Revision of Metal-ligand Bonding in Transition Metal Complexes & Thermodynamic and Kinetic Aspects of Metal Complex
11.11.2024 to 16.11.2024	• Revision of Magnetic Properties of Transition Metal Complex & Electron Spectra of Transition Metal Complex.
18-11-2024 to 23-11-2024	• Revision of Quantum Mechanic s-I & Physical Properties and Molecular Structure

Dr. Deepika Rana
Dept. of Chemistry
GCW, Narnaul

Lesson Plan

Name of Assistant/Associate Prof. : Sandeep Kumar
Class & Section : B.Sc. 5th Semester
Subject : Chemistry
Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	• **NMR Spectroscopy-I** Principle of nuclear magnetic resonance, the PMR spectrum,number of signals, peak areas, equivalent and nonequivalent protons positions of signals
29.07.2024 to 03.08.2024	• Chemical shift,shielding and deshielding of protons, proton counting,splitting of signals and coupling constants, magnetic equivalence of protons.
05.08.2024 to 10.08.2024	• **NMR Spectroscopy-II** Discuss ion of PMR spectra of the molecules: ethyl bromide, npropyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone.
12.08.2024 to 17.08.2024	• Simple problems on PMR spectroscopy for structure determination of organic compounds . Test of NMR
19.08.2024 to 24.08.2024	• **Carbohydrates-I** Classification and nomenclature. Monosaccharides, mechanism of osazone formation, inte rconversion of glucose and fructose, chain lengthening and chain shortening of aldoses.
26.08.2024 to 31.08.2024	• Configuration of monosaccharides. Erythro and threo diastereomers. Conversion of glucose in to mannose. Formation of glycos ides, ethers and esters. Determination of ring size of glucose and fructose.
02.09.2024 to 07.09.2024	• Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism ofmutarotation. Structures of ribose and deoxyribose. Group Discussion in Class.
09.09.2024 to 14.09.2024	• **Carbohydrates-II** An introduc tion to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.
16.09.2024 to 21.09.2024	• **Organometallic Compounds** Organomagnesium compounds: the Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions. Test,Seminar& Group Discussion in Class
23.09.2024 to 28.09.2024	• Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions. Test & Group Discussion in Class
30.09.2024 to 05.10.2024	• Metal- Ligand Bonding in Transition Metal complexes Limitations of valence bond theory , an elementary idea of crystal field theory, crystal field splitting in octahedral, tetrahedral and square planer complexes.
07.10.2024 to 12.10.2024	• factors affecting the crystal field parameters. Thermodynamics and Kinetic Aspects of metal complexes A brief outline of thermodynamic stability of metal complexes and factors affecting the stability.

14.10.2024 to 19.10.2024	• Irving William Series, substitution reactions of square planer complexes of Pt[II], Trans effect. Section – B (23 periods) Magnetic properties of Transition metal complexes.
21.10.2024 to 26.10.2024	• Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility, spin only formula.
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 09.11.2024	• L-S coupling, correlation of μs and μeff values, orbital contribution to magnetic moments, application of magnetic moment data for 3d metal complexes. Electronic spectra of Transition metal complexes Selection rules for d-d transition, spectroscopic ground states, spectrochemical series.
11.11.2024 to 16.11.2024	• Revision of Syllabus
18-11-2024 to 23-11-2024	• Revision of Syllabus

Sandeep Kumar
Dept. of Chemistry
GCW, Narnaul.

Lesson Plan

Name of Assistant/Associate Prof. : Sandeep kumar
Class & Section : B.Sc. 1 st Semester
Subject : Chemistry
Session : 2024-25

Date	Contents
22.07.2024 to 28.07.2024	• Atomic Structure Dual behavior of Matter and Radiation, de Broglie's relation, Heisenberg's Uncertainty Principle, Concept of atomic orbitals, Significance of quantum numbers,
29.07.2022 to 04.08.2022	• Radial and Angular wave functions, Normal and orthogonal wave functions, Significance of and 2, shapes of s, p, d, and f orbital, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.
05.08.2024 to 11.08.2024	Periodic Table and Atomic Properties • Classification of periodic table, Definition of Atomic and Ionic radii, Ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements).
12.08.2024 to 18.08.2024	• Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.Group discussion & Test.
19.08.2024 to 25.08.2024	Gaseous State • Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most probable velocity.
26.08.2024 to 01.09.2024	• Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behavior, Derivation of Van der Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor)
02.09.2024 to 08.09.2024	Critical Phenomenon • Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Van der Waal's constants (Derivation excluded).Group discussion & Test.
09.09.2024 to 15.09.2024	Structure and Bonding • Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.

16.09.2024 to 22.09.2024	Mechanism of Organic Reactions • Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition.
23.09.2024 to 29.09.2024	• Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reaction intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability).
30.09.2024 to 06.10.2024	• Reaction intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability. Group Discussion & Test •
07.10.2024 to 13.10.2024	Liquid State • Structure of liquids, Properties of liquids: Surface tension; Refractive index, viscosity, vapor pressure and optical rotation.
14.10.2024 to 20.10.2024	Solid State • Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements.
21.10.2024 to 26.10.2024	• Seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method.
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 10.11.2024	• Revision of Atomic Structure & Periodic properties
11.11.2024 to 17.11.2024	• Revision of Gaseous State ,Structure and bonding and Mechanism of Organic Reaction.
18-11-2024 to 24-11-2024	• Revision of solid and liquid state.

Sandeep Kumar
Dept. of Chemistry
GCW, Narnaul

DEPARTMENT OF CHEMISTRY

SUBJECT- PHYSICAL CHEMISTRY & INORGANIC CHEMISTRY
Name of Teacher- Dr. NITU KUMARI
CLASS- B.sc 5TH SEM (N.M)
SESSION – 2024-25

TOPICS	DATE	REMARKS
Quantum Mechanic s-I Black-body radiation, Plank's radiation law, photoelectric effect, heat capacity of solids, Compton effect,wave function and its significance of Postulates of quantum mechanics.	22/07/24 to 24/07/24	
quantum mechanical operator, commutation relations, Hamiltonial operator, Hermitian operator, average value of square of Hermitian as a positive quantity, Role of operators in quantum mechanics, To show quantum mechanically that position and momentum cannot be predicated simultaneously, Determination of wave function & energy of a partic le in one dimensional box, Pictorial representation and its significance.	29/07/24 to 31/07/24	
Revision and Test	05/08/24 to 07/08/24	
Physical Properties and Molecular Structure Optica l activity, polarization – (clausius – Mossotti equation). Orientation of dipoles in an electric field, dipole moment, included dipole moment, measurement of dipole moment-temperature method and refractivity method	12/08/24 to 14/08/24	
Dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its determination. Applica tion of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics.	19/08/24 to 21/08/24	
Revision and Test	26/08/2024 to 28/08/2024	
Spectroscopy-I Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Bornoppenheimer approximation, Degrees of freedom.	02/09/24 to 04/09/24	
Rotational Spectrum Diatomic molecules. Energy levels of rigid rotator (semi-classical principles), selection rules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative description of non-rigid rotor, isotope effect.	09/09/24 to 11/09/24	
Revision and Test	16/09/2024 to 18/09/2024	

Spectroscopy-II Vibrational spectrum Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies.	23/09/2024 to 25/09/2024	
Effects of anharmonic motion and isotopic effect on the spectra., idea of vibrational frequencies of different functional groups.	30/09/24 to 02/10/24	
Raman Spectrum: Concept of polarizibility, pure rotational and pure vibrational Raman spectra of diatomic molecules, selectin rules, Quantum theory of Raman spectra.	07/10/24 to 09/10/24	
Revision and Test.	14/10/24 to 16/10/24	
Magnetic Properties of Transition Metal Complexe Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling.	21/10/24 to 23/10/24	
Correlation of s and eff values, orbital contribution to magnetic moments, application of magnetic moment data for 3dmetal complexes.	04/11/24 to 06/11/24	
Electron Spectra of Transition Metal Complexes Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series. Orgel-energy level diagram for d1 and d9 states, discussion of the electronic spectrum of [Ti(H2O)6]3+ complex ion.	11/11/24 to 13/11/24	
Revision and Test.	18/11/24 to onwards	

DEPARTMENT OF CHEMISTRY

SUBJECT- PHYSICAL CHEMISTRY & INORGANIC CHEMISTRY
Name of Teacher- Dr. NITU KUMARI
CLASS- B.sc 3rd SEM (N.M)
SESSION – 2024-25.

TOPICS	DATE	REMARKS
Thermodynamics-I Defin ition of thermodynamic terms: system,surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process.	22/07/24 to 27/07/24	
Concept of heat and work. Zeroth Law of thermodynamics, First law of thermodynamics: statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law – Joule – Thomson coefficient for ideal gass and real gas: and inversion temperature.	01/08/24 to 03/08/24	
Revision & Test	08/08/24 to 10/08/24	
Thermodynamics-II Calculation of w.q. dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reve rsible process,	15/08/24 to 17/08/24	
Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications o f bond energies.	22/08/24 to 24/08/24	
Revision & Test	29/08/2024 to 31/08/2024	
Chemical Equilibrium Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant;	05/09/24 to 07/09/24	
Van't Hoff reaction isochore, Van't Hoff reaction isotherm. Le-Chatetier's principle and its applica tions Clapeyron equation and Clausius – Clapeyron equation its applications.	12/09/24 to 14/09/24	
Revision & Test	19/09/2024 to 21/09/2024	
Dis tributioln Law Nernst distribution law – its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation, association and chemical combination.	26/09/2024 to 28/09/2024	
Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride. (ii) Determination of equilibrium constant of potassium tri-iodide complex and process of extraction.	03/09/24 to 05/10/24	

Revision & Test	10/10/24 to 12/10/24	
Coordination Compounds Werner's coordination theory, effective atomic number concept, chelates, nomenclature of coordination compounds.	17/10/24 to 19/10/24	
Iisomerism in coordination compounds, valence bond theory of transition metal complexes	24/10/24 to 26/10/24	
Revision & Test	07/11/24 to 09/11/24	
Non-aqueous Solvents Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH3 and liquid SO2	14/11/24 to 16/11/24	
Revision & Test	21/11/24 to onwards	

Lesson Plan

Name of Assistant/Associate Prof. : Dr. Sonam

Class & Section : B.Sc(Med) 3rd Semester

Subject : Chemistry

Session : 2024-25

Date	Contents
22.07.2024 to 27.07.2024	• **Inorganic Chemistry**-Chemistry of Elements of Ist transition series: Definition of transition elements, position in the periodic table, General characteristics & properites of Ist transition elements,. Structures & properties of some compounds of transition elements – TiO2, VOCl2 , FeCl3 , CuCl2 and Ni (CO)4.
29.07.2024 to 03.08.2024	• Chemistry of Elements of IInd & IIIrd transition series General characteristics and properties of the IInd and IIIrd trans ition elements Comparison of properties of 3d elements with 4d & 5d elements with reference only to ionic radii, oxidation state, magnetic and Spectral properties and stereochemistry.
05.08.2024 to 10.08.2024	• Coordination Compounds Werner's coordination theory, effective atomic number concept, chelates. Nomenclature of coordination compounds, isomerism in coordination compounds.
12.08.2024 to 17.08.2024	• Valence bond theory of transition metal complexes Non-aqueous Solvents Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH3 and liquid SO2.
19.08.2024 to 24.08.2024	• **Organic Chemistry**-Alcohols Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation.
26.08.2024 to 31.08.2024	• Chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc)4 and HIO4] and pinacol-pinacolone rearrangement. Epoxides Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides.
02.09.2024 to 07.09.2024	• Phenols Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.
09.09.2024 to 14.09.2024	• Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction and Schotten and Baumann reactions Ultraviole t (UV) absorption spectroscopy .
16.09.2024 to 21.09.2024	• Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones,Woodward- Fieser rules, calculation of max of simple conjugated dienes .
23.09.2024 to 28.09.2024	• Carboxylic Acids & Acid Derivatives Nomenclatu re of Carboxylic acids, structure and

	bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids.
30.09.2024 to 05.10.2024	• Mechanism of decarboxylation. Structure , nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides. Relative s tability o f acyl derivatives. Phys ical properties, interconvers ion of acid derivatives by nucleophilic acyl substitution. Mechanisms of es ter ifica tion and hydrolysis (acidic and basic).
07.10.2024 to 12.10.2024	• **Physical Chemistry**-Thermodynamics-I Defin ition of thermodynamic terms: system,surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work. Zeroth Law of thermodynamics, First law of thermodynamics: statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship.
14.10.2024 to 19.10.2024	• Joule's law – Joule – Thomson coefficient for ideal gass and real gas: and inversion temperature. Thermodynamics-II Calculation of w.q. dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reve rsible process, Temperature dependence of enthalpy, Kirchoffs equation. Bond energies and applications o f bond energies.
21.10.2024 to 26.10.2024	• Chemical Equilibrium Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant; Van't Hoff reaction isochore, Van't Hoff reaction isotherm.
27.10.2024 to 03.11.2024	• **Diwali Vacation**
04.11.2024 to 09.11.2024	• Le-Chatetier's principle and its applica tions Clapeyron equation and Clausius – Clapeyron equation its applications. Dis tribution Law Nernst distribution law – its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation, association and chemical combination.
11.11.2024 to 16.11.2024	• Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride. (ii) Determination of equilibrium constant of potassium tri-iodide complex and process of extraction.
18-11-2024 to 23-11-2024	• Revision of Syllabus

Dr.Sonam
Dept. of Chemistry
GCW, Narnaul.