

LESSON PLAN

Name of the Faculty : **Mr. Gurdeep**
Discipline : **B.SC- II (MEDICAL)**

Semester : **Semester-III**

Subject : **Organic Chemistry**

Lesson Plan duration: **From October 2021 to December 2021**

Week/Month	Name of Topics
2 week October	Alcohols nomenclature, methods of formation by reduction of—Monohydric alcohols aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols
3 week October	Dihydric alcohols — nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc) ₄ and HIO ₄] and pinacol-pinacolone rearrangement. Phenols Nomenclature
4 week October	structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols
1 week of November	resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction and Schotten and Baumann reactions.,
2 week of November	Epoxides Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening,
3 week of November	reactions of Grignard and organolithium reagents with epoxides Ultraviolet (UV) absorption spectroscopy Absorption laws (Beer-Lambert law),
4 week of November	molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome.
1 week of December	Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and m a x of simple enones Woodward- Fieser rules, calculation of β, α , unsaturated ketones.

2 week of December	, conjugated dienes and Applications of UV Spectroscopy in structure elucidation of simple organic compounds. Carboxylic Acids & Acid Derivatives Nomenclature of Carboxylic acids,
3 week of December	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.
4week of December	Reduction of carboxylic acids. Mechanism of decarboxylation. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).
After December	Revision and Class tests.

Name of the Faculty : **Mr. GURDEEP**
Discipline : **B.SC- III (MED. + NON MEDICAL)**

Semester : **Semester-V**

Subject : **Physical Chemistry**

Lesson Plan duration: **From July 2018 to November 2018** :

Week/Month	Name of Topics
2 week October	Black-body radiation, Plank's radiation law, photoelectric effect, heat capacity of solids
3 week October	Compton effect, wave function and its significance of Postulates of quantum mechanics. Quantum mechanical operator, commutation relations, , Hamiltonian Operator, Hermitian operator, average value of square of Hermitian as a positive quantity
4 week October	Role of operators in quantum mechanics, To show quantum mechanically that position and momentum cannot be predicated simultaneously
1 week of November	Determination of wave function & energy of a particle in one dimensional box, Pictorial representation and its significance

2 week of November	Introduction to Optical activity, polarization – (Clausius – Mossotti equation). Orientation of dipoles in an electric field, dipole moment, induced dipole moment
3 week of November	Measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules, Magnetic permeability, magnetic susceptibility and its determination.,
4 week of November	Application of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics,
1 week of December	Introduction to Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born Oppenheimer approximation,
2 week of December	Degrees of freedom. 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.
3 week of December	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, effects of anharmonic motion.
4 week of December	Isotopic effect on the spectra., idea of vibrational frequencies of different functional groups. Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules, Quantum theory of Raman spectra.
After December	Revision and Class tests.

Name of the Faculty : **Mr. RAVI KUMAR**
Discipline : **B.SC- III (Organic Chemistry)**
Semester : **Semester-V**
Subject : **Organic Chemistry**
Lesson Plan duration: **From Sept. 2021 to Feb 2022**
Paper Code :

Week/Month	Name of Topics
4 week sept.	Introduction to Principle of nuclear magnetic resonance, The PMR spectrum ,

1 week Oct.	Number of signals, peak Areas, Equivalent and non equivalent protons positions of signals and chemical shift
2 week Oct.	shielding and deshielding of protons proton counting, splitting of signals
3 week Oct.	Coupling constants, magnetic equivalence of protons
4 week Oct.	Discussion of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide,
1 week of November	1,1-dibromoethane, 1,1,2-tribromoethane., ethanol, Acetaldehyde, ethyl acetate, toluene,
2 week of November	, benzaldehyde and acetophenone. Introduction to Classification and nomenclature
3 week of November	Monosaccharides, mechanism of osazone formation, Interconversion of glucose and fructose,
4 week of November	chain lengthening and chain shortening of aldoses. Configuration of monosaccharides. Erythro and threo diastereomers.
1 week of December	Conversion of glucose into mannose. Formation of glycosides, ethers and esters. Determination of ring size of glucose and fructose.
2 week of December	. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism of mutarotation. Structures of ribose and deoxyribose
3 week of December	An introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination. Organomagnesium compounds:..
4 week of December	Grignard reagents-formation, structure and chemical reactions. Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions
January	Revision and Class tests.

Name of the Faculty : **Mr. RAVI KUMAR**
Discipline : **B.SC- III (NON MEDICAL + medical)**
Semester : **Semester-V**
Subject : **INORGANIC CHEMISTRY**

Lesson Plan duration:

From Sept.2020 to Feb. 2021

Paper Code :

Week/Month	Name of Topics
4 week of September	Metal- Ligand Bonding in Transition Metal complexes
1 week Oct.	Limitations of valence bond theory, an elementary idea of crystal field theory
2 week Oct.	Crystal field splitting in octahedral, tetrahedral and square planer complexes
3 week Oct.	factors affecting the crystal field parameters.
4 week Oct	Organometallic Compounds Organomagnesium compounds: the Grignard reagents-formation,structure and chemical reactions
1 week of November	Organozinc compounds: formation and chemical reactions.Organolithium compounds: formation and chemical reactions.
2 week of November	, Thermodynamics and Kinetic Aspects of metal complexes A brief outline of thermodynamic stability of metal complexes
3 week of November	. and factors affecting the stability, Irving William Series, substitution reactions of squareplaner complexes of Pt[II], Trans effect
4 week of November	Magnetic properties of Transition metal complexes Types of magnetic materials, magnetic susceptibility, method of determiningmagnetic susceptibility
1 week of December	, spin only formula, L-S coupling correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments,
2 week of December	application of magnetic momentdata for 3d metal complexes. Electronic spectra of Transition metal complexes Selection rules for d-d transition,

3 week of December	spectroscopic ground states, spectrochemical series different cases of P subshell and D subshell.
4 week of December	orgel energy level diagram for d1 and d9 states, discussion of electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ complex ion.
January	Revision and Class tests.

Name of the Faculty : **Mr. GURDEEP SIDHU**
Discipline : **B.SC- II (MEDICAL and NON MEDICAL)**
Semester : **Semester-III**
Subject : **Physical Chemistry**
Lesson Plan duration: **From Sept. 2020 to Feb. 2021**
Paper Code :

Week/Month	Name of Topics
4 week Sept	Thermodynamics Definition of thermodynamic terms: system, surrounding etc
1 week Oct.	. Types of systems, intensive and extensive properties
2 week Oct.	State and path functions and their differentials. Thermodynamic process.,
3 week Oct.	Thermodynamic equilibrium, Concept of heat and work First law of thermodynamics: statement
4 week Oct.	concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship

1 week of November	. Joule–Thomson coefficient for ideal gas and real gas and inversion temperature
2 week of November	Calculation of w,q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.
3 week of November	Chemical Equilibrium Equilibrium constant and free energy, concept of chemical potential,
4 week of November	Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant
1 week of December	t. Clausius–Clapeyron equation and its applications
2 week of December	Distribution Law Nernst distribution law – its thermodynamic derivation,
3 week of December	Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride
4 week of December	(ii) Determination of equilibrium constant of potassium tri-iodide complex and (iii) Process of extraction. More stress on numerical problems
January	Revision and Class tests.

Name of the Faculty : **Ms. Priya**
Discipline : **B.SC- II (MEDICAL AND NON MEDICAL)**

Semester : **Semester-III**

Subject : **Organic Chemistry**

Lesson Plan duration: **From Oct 2021 to Jan 2022**

Week/Month	Name of Topics
2 week October	Alcohols nomenclature, methods of formation by reduction of—Monohydric alcohols aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding. Acidic nature. Reactions of alcohols
3 week October	Dihydric alcohols — nomenclature, methods of formation, chemical reactions of vicinal glycols,

4 week October	oxidative cleavage [Pb(OAc) ₄ and HIO ₄] and pinacol-pinacolone rearrangement. Phenols Nomenclature
1 week of November	structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution,
2 week of November	Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction and Schotten and Baumann reactions.
3 week of November	Epoxides Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening,
4 week of November	, reactions of Grignard and organolithium reagents with epoxides Ultraviolet (UV) absorption spectroscopy Absorption laws (Beer-Lambert law),
1 week of December	molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation. Concept of chromophore and auxochrome.
2 week of December	Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and α,β -unsaturated ketones Woodward-Fieser rules, calculation of λ_{max} of α,β -unsaturated ketones, α,β -conjugated dienes and Applications of UV Spectroscopy in structure elucidation of simple organic compounds. Carboxylic Acids & Acid Derivatives Nomenclature of Carboxylic acids,
3 week of December	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.
4 week of December	Reduction of carboxylic acids. Mechanism of decarboxylation. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).
After December	Revision and Class tests.

Name of the Faculty : **Ms. priya**
Discipline : **B.SC- II (NON MEDICAL)**
Semester : **Semester-III**
Subject : **Physical Chemistry**
Lesson Plan duration: **From Oct 2021 to Jan. 2022**

Paper Code :

Week/Month	Name of Topics
2 week October	Thermodynamics Definition of thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties
3 week October	State and path functions and their differentials. Thermodynamic process.,
4 week October	Thermodynamic equilibrium, Concept of heat and work First law of thermodynamics: statement
1 week of November	concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship
2 week of November	. Joule–Thomson coefficient for ideal gas and real gas and inversion temperature
3 week of November	Calculation of w,q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.
4 week of November	Chemical Equilibrium Equilibrium constant and free energy, concept of chemical potential,
1 week of December	Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant. Clausius–Clapeyron equation and its applications
2 week of December	Distribution Law Nernst distribution law – its thermodynamic derivation,
3 week of December	Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride
4 week of December	(ii) Determination of equilibrium constant of potassium tri-iodide complex and (iii) Process of extraction. More stress on numerical problems
After December	Revision and Class tests.

Name of the Faculty : Ms Priya
Discipline : B.SC- I

Semester : Semester-I

Subject : Inorganic Chemistry

Lesson Plan duration:

From Oct. 2021 to Jan 2022

Paper Code

Week/Month	Name of Topics
2 week October	Atomic Structure Idea of de Broglie matter waves, Heisenberg's uncertainty principle, atomic orbitals, quantum numbers,
3 week October	radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ^2 , probability distribution curves, shapes of s, p, d, f orbitals, Aufbau and Pauli exclusion principles
4 week October	Hund's multiplicity rules, Electronic configuration of elements, effective nuclear charge, Slater's rules. Periodic table and atomic properties Classification of periodic table into s, p, d, f blocks,
1 week of November	atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, methods of determination or evaluation, trend in periodic table (in s and p-block elements
2 week of November	Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.
3 week of November	Covalent Bond Valence bond theory (Heitler-London and Pauling approach) and its limitation, directional characteristics of covalent bond
4 week of November	various type of hybridisation and shapes of simple inorganic molecules and ions (BeF_2 , BF_3 , CH_4 , PF_5 , SF_6 , IF_7 , SO_4^{2-} , ClO_4^- , NO_3^-)
1 week of December	valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3 , H_2O , SnCl_2 , ClO_3^- and ICl_2^- . Molecular orbital theory of homonuclear (N_2 , O_2) heteronuclear (CO and NO) diatomic molecules and
2 week of December	ions, bond energy, bond angle, bond length and dipole moments, percentage ionic character from dipole moment and electronegativity difference,
3 week of December	Ionic Solids Ionic structures (NaCl , CsCl , ZnS (Zinc blende), CaF_2) size effects, radius ratio rule and its limitations, Madelung constant,
4 week of December	Stoichiometric and Non stoichiometric defects in crystals, Lattice energy (mathematical derivation excluded) and Born Haber cycle, Solvation energy and its relation with solubility of Ionic solids. Polarizing power and Polarisability of ions, Fajan's rule
After December	Revision

Name of the Faculty : **Mr. Sumanlata**
Discipline : **B.SC- I (NM& MED)**

Semester : Semester-I

Subject : Organic Chemistry

Lesson Plan duration: From Oct 2021 to jan 2022

Paper Code :

Week/Month	Name of Topics
2 week October	Structure and Bonding Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions,
3 week October	resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.
4 week October	Stereochemistry of Organic Compounds Concept of isomerism. Types of isomerism. elements of symmetry, molecular chirality,—Optical isomerism enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic center
1 week of November	, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and abso
2 week of November	Relative and absolute configuration, sequence rules, R & S systems of nomenclature. determination of configuration of—Geometric isomerism geometric isomers. E & Z system of nomenclature,
3 week of November	conformational analysis of ethane—Conformational isomerism and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman projection and Sawhorse formulae, Difference between configuration and conformation.
4 week of November	Mechanism of Organic Reactions Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking.
1 week of December	Types of reagents – electrophiles and nucleophiles. Types of organic reactions. carbocations, carbanions, free radicals,—Reactive intermediates carbenes,(formation, structure & stability). Alkanes and Cycloalkanes IUPAC nomenclature of branched and unbranched alkanes,
2 week of December	classification of carbon atoms in alkanes. Isomerism in alkanes, sources,methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids,
3 week of December	physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.nomenclature,, synthesis of cycloalkanes and their derivatives —Cycloalkanes -dihalides, , ω , α photochemical (2+2) cycloaddition reactions,,

4week of December	dehalogenation of pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations theory of strainless rings
After December	revision

Name of the Faculty : **Mr. Sumanlata**
Discipline : **B.SC- I (NM)**
Semester : **Semester-1**
Subject : **Physical Chemistry**
Lesson Plan duration: **From Oct 2021 to Jan 2022**
Paper Code : **CH-102**

Week/Month	Name of Topics
2 week October	Critical temperature, Critical pressure, critical volume and their determination. PV isotherms of real gases,
3 week October	continuity of states, the isotherms of Vander Waal's equation, relationship between critical constants and Vander Waal's constants. Critical compressibility factor
4 week October	The Law of corresponding states. Liquefaction of gases.
1 week of November	Structure of liquids. Properties of liquids –surface tension.

2 week of November	Viscosity vapour pressure and optical rotations and their determination.
3 week of November	Classification of solids, Laws of crystallography – (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry.
4 week of November	Symmetry elements of crystals. Definition of unit cell & space lattice. Bravais lattices, crystal system. X-ray diffraction by crystals. Derivation of Bragg equation.
1 week of December	Determination of crystal structure of NaCl, KCl. Liquid crystals: Difference between solids,
2 week of December	liquids and liquid crystals, types of liquid crystals. Applications of liquid crystals.
3 week of December	Revision and Class tests.
4 week of December	Revision and Class tests.
After December	Revision and Class tests.

Name of the Faculty : **Mr. Suman lata**
Discipline : **B.SC- I**
Semester : **Semester-I**

Subject : Inorganic Chemistry

Lesson Plan duration: From Sep 2021 to Jan 2022

Paper Code

Week/Month	Name of Topics
2 week October	Atomic Structure Idea of de Broglie matter waves, Heisenberg's uncertainty principle, atomic orbitals, quantum numbers,
3 week October	radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ^2 , probability distribution curves, shapes of s, p, d, f orbitals, Aufbau and Pauli exclusion principles
4 week October	Hund's multiplicity rules, Electronic configuration of elements, effective nuclear charge, Slater's rules. Periodic table and atomic properties Classification of periodic table into s, p, d, f blocks,
1 week of November	atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, methods of determination or evaluation, trend in periodic table (in s and p-block elements
2 week of November	Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.
3 week of November	Covalent Bond Valence bond theory (Heitler-London and Pauling approach) and its limitation, directional characteristics of covalent bond
4 week of November	various type of hybridisation and shapes of simple inorganic molecules and ions (BeF_2 , BF_3 , CH_4 , PF_5 , SF_6 , IF_7 , SO_4^{2-} , ClO_4^- , NO_3^-)
1 week of December	valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3 , H_2O
2 week of December	, SnCl_2 , ClO_3^- and ICl_2^- . Molecular orbital theory of homonuclear (N_2 , O_2) heteronuclear (CO and NO) diatomic molecules and
3 week of December	ions, bond energy, bond angle, bond length and dipole moments, percentage ionic character from dipole moment and electronegativity difference, Ionic Solids Ionic structures (NaCl , CsCl , ZnS (Zinc blende), CaF_2) size effects, radius ratio rule and its limitations, Madelung constant,
4 week of December	Stoichiometric and Non stoichiometric defects in crystals, Lattice energy (mathematical derivation excluded) and Born Haber cycle, Solvation energy and its relation with solubility of Ionic solids. Polarizing power and Polarisability of ions, Fajan's rule

Name of the Faculty : Ms. Suman Lata
Discipline : B.SC- III (MEDICAL)

Semester : Semester-V

Subject : INORGANIC CHEMISTRY

Lesson Plan duration: From Oct. 2021 to Jan. 2022

Paper Code :

Week/Month	Name of Topics
2 week Oct.	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
3 week Oct.	factors affecting the crystal field parameters.
4 week Oct	Organometallic Compounds Organomagnesium compounds: the Grignard reagents- formation, structure and chemical reactions
1 week of November	Organozinc compounds: formation and chemical reactions. Organolithium compounds: formation and chemical reactions.
2 week of November	, Thermodynamics and Kinetic Aspects of metal complexes A brief outline of thermodynamic stability of metal complexes
3 week of November	. and factors affecting the stability, Irving William Series, substitution reactions of square planer complexes of Pt[II], Trans effect
4 week of November	Magnetic properties of Transition metal complexes Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility
1 week of December	, spin only formula, L-S coupling correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments,
2 week of December	application of magnetic moment data for 3d metal complexes. Electronic spectra of Transition metal complexes Selection rules for d-d transition,

3 week of December	spectroscopic ground states, spectrochemical series different cases of P subshell and D subshell.
4 week of December	orgel energy level diagram for d1 and d9 states, discussion of electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ complex ion.
January	Revision and Class tests.