

**Govt. College Kharkhara (Rewari)**  
**Department of Chemistry Lesson Plan (2025-26)**

Lesson Plan (2025-26)		
B.Sc. Physical Science 1st Semester		
Subject : Chemistry (Major)		Name of Asst. Prof. : Dr Manu Kumar Bhandoria
Week	Date	Topic
Wk-1	01.08.25-08.08.25	Atomic Structure: Dual Behaviour of matter and radiation, de Broglie's relation, Heisenberg's uncertainty principle, Atomic orbitals and quantum numbers, Radial and angular wave function
Wk-2	11.08.25-14.08.25	Normal and orthogonal wave functions, Significance of $\psi$ and $\psi^2$ , Shape of orbitals, electronic configuration rules and Slater's rule
Wk-3	14.08.25-23.08.25	Classification of periodic table, definition and variation of various periodic properties,
Wk-4	25.08.25-30.08.25	Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio
Wk-5	01.09.25-06.09.25	Kinetic theory of gases, Maxwell distribution of velocities and energies, calculation of various types of velocity
Wk-6	08.09.25-13.09.25	Collision diameter, number and frequency, mean free path, Van der Waal's equation for real gases, calculation of Boyle's temp.
Wk-7	15.09.25-20.09.25	Critical constants and Van der Waal's constants
Wk-8	22.09.25-27.09.25	Structure and bonding: Van der Waal's interactions, Resonance,
Wk-9	29.09.25-04.10.25	Hyperconjugation, Inductive effect, Electromeric effect
Wk-10	06.10.25-11.10.25	Mechanism of organic reactions: curved notation, types of bond fission and reagent,
Wk-11	13.10.25-18.10.25	Types of organic reactions-Substitution, Addition, Condensation rxn, Rearrangement pericyclic and isomerisation rxn
Wk-12	27.10.25-31.10.25	Reactive intermediates: Carbocations, carbanions and free radicals
Wk-13	03.11.25-08.11.25	Liquid State: Structure, Surface tension, refractive index,
Wk-14	10.11.25- 15.11.25	Viscosity, vapour pressure and optical rotation
Wk-15	17.11.25-22.11.25	Solid State: Classification, laws of interfacial angles and rotational indices,
Wk-16	24.11.25-29.11.25	Miller indices, Bravais lattice, X-ray diffraction, Bragg's law, Laue method, rotating crystal method and powder pattern method

Lesson Plan (2025-26)		
B.Sc. 5th Semester		
Subject: Inorganic & Physical Chemistry		Name of Asst. Prof: Dr Manu Kumar Bhandoria
Week	Date	Topic
Wk-1	01.08.25-08.08.25	Valence bond theory and its limitations
Wk-2	11.08.25-14.08.25	Crystal field theory and factors affecting it
Wk-3	14.08.25-23.08.25	Thermodynamic stability of metal complexes and factors affecting it
Wk-4	25.08.25-30.08.25	Irving William series and substitution reaction for sq. Planar Complexes of Pt(II)
Wk-5	01.09.25-06.09.25	Types of magnetic material, magnetic susceptibility and its determination
Wk-6	08.09.25-13.09.25	Spin formula, L-S coupling, spectroscopic ground state terms,
Wk-7	15.09.25-20.09.25	Calculations of Microstates, Electronic spectra of metal complexes
Wk-8	22.09.25-27.09.25	Splitting of R-S state in Octahedral and Tetrahedral Crystal fields
Wk-9	29.09.25-04.10.25	Spectrochemical series, Orgel energy level diagrams
Wk-10	06.10.25-11.10.25	Black body radiation, Planck's radiation law, Photoelectric effect
Wk-11	13.10.25-18.10.25	Compton effect and Compton shift,
Wk-12	27.10.25-31.10.25	Heat capacities of solids, Dulong and Petit's Law
Wk-13	03.11.25-08.11.25	De Broglie hypothesis and Bohr's theory,
Wk-14	10.11.25- 15.11.25	Heisenberg principle and its significance, Quantum mechanical Model
Wk-15	17.11.25-22.11.25	Schrodinger wave equation, Operators in quantum

Wk-16	24.11.25-29.11.25	Postulates of Quantum Mechanics and Particle in 1D box, Wave function of H-atom
-------	-------------------	---

Lesson Plan (2025-26)		
B.A. 1st Semester		
Subject : Chemistry (MDC-1)		Name of Asstt Prof. : Dr Manu Kumar Bhandoria
Week	Date	Topic
Wk-1	01.08.25-08.08.25	Elementary introduction of Atomic structure
WK-2	11.08.25-14.08.25	Representation of elements and lewis structure
Wk-3	14.08.25-23.08.25	Electronic Configuration (1-30)
Wk-4	25.08.25-30.08.25	Chemical Bonding
Wk-5	01.09.25-06.09.25	Tetravalency of Carbon and its allotropic forms
Wk-6	08.09.25-13.09.25	Properties of the allotropic forms of Carbon
Wk-7	15.09.25-20.09.25	Hydrocarbons (1-5), Nomenclature of linear compounds
Wk-8	22.09.25-27.09.25	Applications of Hydrocarbons
Wk-9	29.09.25-04.10.25	Elementary idea of Synthetic and Natural Polymers,
Wk-10	06.10.25-11.10.25	Homopolymers and Copolymers
Wk-11	13.10.25-18.10.25	Uses & properties of - Natural & Vulcanised Rubber, Polyethene, PVC
Wk-12	27.10.25-31.10.25	Uses & properties of - Styrene, Teflon, PAN, Nylon-66
Wk-13	03.11.25-08.11.25	Elementary Idea of Natural and Synthetic food preservatives
Wk-14	10.11.25-15.11.25	Uses and properties of various food preservatives
Wk-15	17.11.25-22.11.25	Rancidity, Food preservation processes (pickle, Jam)
Wk-16	24.11.25-29.11.25	Artificial sweeteners, their uses and properties

Lesson Plan (2025-26)		
B.Sc. Physical Science 3rd Semester		
Subject : Chemistry (Major)		Name of Asst. Prof. : Dr Kavita Yadav
Week	Date	Topic
Wk-1	01.08.25-08.08.25	s and p Block Elements: Salient features of Hydroxide, Oxides, hydroxides of s block elements (Preparation Excluded)
WK-2	11.08.25-14.08.25	Structure, Preparation and properties of Diborane and Borazine, Catenation, carbide Fluorocarbons, Silicates (Structures)
Wk-3	14.08.25-23.08.25	Structures of Oxoacids of N, P, S and Cl and comparison of their acidic strength.
Wk-4	25.08.25-30.08.25	Chemical properties of Noble gases, Chemistry of Xe, Structure and bonding in fluorides, Oxides and Oxyfluorides of Xe.
Wk-5	01.09.25-06.09.25	Electrolytic Conduction, Factors affecting it, Specific, molar, equivalent conductance and relation among them, Variation on dilution in them.
Wk-6	08.09.25-13.09.25	Applications of Kohlrausch's Law for calculating conductance of weak electrolyte at infinite dilution, Concept of pH and pKa, Buffer Solution, Buffer action, Henderson - Hazel equation, Buffer mechanism of buffer action,
Wk-7	15.09.25-20.09.25	Reversible and Irreversible cell, Calculation of thermodynamic quantities of Cell reaction ( $\Delta G$ , $\Delta H$ and $K$ ), Types of reversible electrodes-metal metal ion, gas electrodes, metal-insoluble salt -anion and redox electrodes
Wk-8	22.09.25-27.09.25	Nernst equation, SHE, reference electrodes, Applications of EMF measurement in solubility product and potentiometric titrations using glass electrodes
Wk-9	29.09.25-04.10.25	Alkyne: Nomenclature, structure and methods of preparations-using Calcium Chloride, Dehydrohalogenation, Kolbe's electrolysis, Chemical reactions
Wk-10	06.10.25-11.10.25	Mechanism of electrophilic and nucleophilic addition reaction, formation of metal acetylides, addition of bromine and $\text{KMnO}_4$ , ozonolysis, acidity of alkynes
Wk-11	13.10.25-18.10.25	Structural and Stereoisomerism, symmetry elements, enantiomers, optical activity, properties of enantiomers, Chiral and Achiral molecules (upto 2 chiral centres)
Wk-12	27.10.25-31.10.25	Diastereomers, threo- and erythro- nomenclature, meso compound, relative and absolute configuration, sequence rules, R and S system, Cis-Trans isomerism, E and Z system,

Wk-13	03.11.25-08.11.25	Conformational analysis of ethane, n-butane, cyclohexane, axial and equatorial bonds, Newmann and Sawhorse projection formulae.
Wk-14	10.11.25- 15.11.25	Benzene and its derivative: Nomenclature, Aromatic nucleus and side chain, Huckel rule of aromaticity, Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel-Craft reaction
Wk-15	17.11.25-22.11.25	Energy profile diagrams, Activating, deactivating substituents and orientation, Alkyl Halides: Nomenclature, preparation from alkene and alcohol, SN1 and SN2 reactions with energy profile diagrams
Wk-16	24.11.25-29.11.25	Aryl Halides: Preparations-Halogenation, Sandmeyer's reaction, Addition-elimination and elimination-addition mechanisms of aromatics SN reactions, Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides

Lesson Plan (2025-26)		
<b>Name of the Assistant Professor : Dr Kavita Yadav</b>		
<b>Subject: Chemistry                      Paper: Organic Chemistry                      Sem: 5th Sem</b>		
Week	Date	Topic
1	01.08.25-08.08.25	Carbohydrates I : Classification and nomenclature.
2	11.08.25-14.08.25	Monosaccharides, Osazone, Interconversion of Glucose and Fructose
3	14.08.25-23.08.25	Chain lengthening and Chain shortening of aldoses, Configuration of monosaccharides
4	25.08.25-30.08.25	Erythro and Threo diastereomers, Conversion of Glucose and Mannose, Formation of glycosides, ethers and esters
5	01.09.25-06.09.25	Determination of ring size of Glucose and Fructose & their open chain structure, Mechanism of Mutarotation, Structure of ribose and deoxyribose
6	08.09.25-13.09.25	Carbohydrates II: Introduction of Disaccharides ( maltose, sucrose & lactose)
7	15.09.25-20.09.25	Polysaccharides (Starch and Cellulose), Structure of various carbohydrates
8	22.09.25-27.09.25	Organometallic Compounds:- Organomagnesium compounds- preparation and chemical properties
9	29.09.25-04.10.25	Organozinc compounds – preparation and chemical properties
10	06.10.25-11.10.25	Organolithium compounds- preparation and chemical properties
11	13.10.25-18.10.25	NMR Spectroscopy I-Principle, No. of signal and peak area, Equivalent and non-equivalent protons
12	27.10.25-31.10.25	Position of signal and chemical shift, Shielding and Deshielding of protons
13	03.11.25-08.11.25	Proton counting, Shifting of signals and coupling constant, Magnetic equivalence of protons
14	10.11.25- 15.11.25	NMR Spectroscopy II
15	17.11.25-22.11.25	Discussion of NMR spectra of molecules
16	24.11.25-29.11.25	Revision

#### Lesson Plan (2025-26) Odd Semester

**Name of the Assistant Professor : Dr Kavita Yadav**

**Class B.Sc. 1st Sem      Subject: Value Added Courses      Paper: Human Values & Ethics**

Week	Date	Topic
Wk-1	01.08.25-08.08.25	Understanding the need , content and process of value education
Wk-2	11.08.25-14.08.25	Classification of value education: understanding personal and social values
Wk-3	14.08.25-23.08.25	Moral & spiritual values: Difference between ideology and values
Wk-4	25.08.25-30.08.25	Understanding Harmony with self, society and nature
Wk-5	01.09.25-06.09.25	Human Values and ethics: meaning, significance and relation between them
Wk-6	08.09.25-13.09.25	Relevance of Human values: Integrity Empathy, lokasangraha, Brahmavihara
Wk-7	15.09.25-20.09.25	Theory of Naya(Jainism) Deontology, Virtue Ethics, Utilitarianism
Wk-8	22.09.25-27.09.25	Relationship among self, Identity and personality

Wk-9	29.09.25-04.10.25	Three Gunas theory of Sankhya, Four Antah Karans in Yoga
Wk-10	06.10.25-11.10.25	Panchkosha in Upanishada, well being and its relation to happiness.
Wk-11	13.10.25-18.10.25	Nature, Characteristics and scope of professional Ethics and its types
Wk-12	27.10.25-31.10.25	Professional Values, Trusteeship, Inclusiveness, commitment, Sustainability
Wk-13	03.11.25-08.11.25	Accountability, Transparency, Impartiality, Values for global citizenship
Wk-14	10.11.25- 15.11.25	Equality, Justice and Human dignity, Nature, Need and types of Competencies
Wk-15	17.11.25-22.11.25	Core Competencies: Communication, teamwork, planning and achieving goals
Wk-16	24.11.25-29.11.25	Functional competencies: Analytical thinking, knowledge sharing and learning, decision making and partner building

<b>Lesson Plan (2025-26)</b>		
<b>B.Sc. Physical Science 3rd Semester</b>		
<b>Subject : SEC (Food Adulteration Testing)</b>		<b>Name of Asst. Prof. : Dr Kavita Yadav</b>
<b>S.No</b>	<b>WEEK</b>	<b>TOPIC</b>
1	01.08.25-08.08.25	Introduction to Food Adulteration Testing as SEC subject
2	11.08.25-14.08.25	Common foods subjected to adulteration
3	14.08.25-23.08.25	Adulteration definition and types- Poisonous substances, Foreign matter, Cheap substitutes, spoiled parts
4	25.08.25-30.08.25	Adulteration through food additives- Intentional and incidental
5	01.09.25-06.09.25	General impact on Human Health
6	08.09.25-13.09.25	Adulteration of common foods and methods of detection: Means of adulteration
7	15.09.25-20.09.25	Methods of detection of adulterants in milk, oil and sugar
8	22.09.25-27.09.25	Methods of detection of adulterants in spices, processed food, Fruits and vegetables
9	29.09.25-04.10.25	Additives and sweetening agents, Present laws and Procedures on Adulteration
10	06.10.25-11.10.25	Highlights of Food Safety and standard Act 2006 (FSSA)
11	13.10.25-18.10.25	Food Safety and Standards Authority of India- Rules and Procedure of Local Authorities
13	27.10.25-31.10.25	Role of Voluntary agencies such as Agmark, I.S.I. Quality control laboratories of companies
14	03.11.25-08.11.25	Private testing laboratories, Quality control laboratories of consumer co-operatives
15	10.11.25- 15.11.25	Consumer education, consumer's problems right and responsibilities
16	17.11.25-22.11.25	COPRA 2019 – Offences and penalties
17	24.11.25-29.11.25	Procedure to complain and compensation to victim