Lesson Plan

MCM DAV College for Women, Sector – 36 A, Chandigarh

Monthly Teaching Plans (Odd Semester)

Session: 2026-27

Name of the Teacher: Dr. Shefali Dhiman, Dr. Sagarika Dev, Dr. Rishu

Department: Chemistry

Class: B.Sc (1st Semester) **Subject:** Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1.	20-07-2026	31-07-2026	**INORGANIC CHEMISTRY** **Atomic Structure:** Idea of de-Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, the significance of ψ and ψ2, quantum numbers, radial and angular wave functions (excluding mathematical relations), probability distribution curves, shapes of *s*, *p*, and *d* orbitals. **ORGANIC CHEMISTRY** **Structure and Bonding:** Hybridisation, Bond lengths and bond Angles,	Lecture

			Bond Energy, Localised and Delocalized chemical bond, Van der Waal's interaction, Resonance and Resonance effect, Hyperconjugation, Inductive and Field effect, Electromeric effect, Hydrogen Bonding. **PHYSICAL CHEMISTRY** **Basic Concepts of Mathematics :** Logarithmic relations, differentiation and integration of functions like e^x, x^n, sin x, and log x. Terms of mean and median, precision and accuracy in chemical analysis. **Chemical Kinetics-I:** Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction-concentration,temperature, pressure, solvent, light, and catalyst. Concentration dependence of rates	
2.	01-08-2026	31-08-2026	**INORGANIC CHEMISTRY** **Atomic Structure:** Aufbau and Pauli exclusion principles, Hund's multiplicity rule, Electronic configurations of the elements and ions. **ORGANIC CHEMISTRY**	Lecture and discussion

			Reactive Intermediates: Curved arrow notation, Drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking, Types of Reagents – Electrophiles and nucleophiles, Types of Organic Reactions. Reactive intermediates- Carbocations, Carbanions, Free Radicals, Carbenes, Arynes and Nitrenes (with examples). Assigning Formal charges on intermediates and other ionic species **<u>PHYSICAL CHEMISTRY</u>** **Chemical Kinetics-I** mathematical characteristics of simple chemical reactions – zero order, first order, second order, pseudo order, half-life, and mean life. Determination of the order of reaction – differential method, method of integration, method of half-life period and isolation method, Radioactive decay as a first-order phenomenon. **Chemical Kinetics-II:** Theories of Chemical Kinetics: Effect of temperature on rate of reaction, Arrhenius	

			equation, concept of activation energy.	
3.	01-09-2026	30-09-2026	**INORGANIC CHEMISTRY** **Periodic Properties:** Position of elements in the periodic table, effective nuclear charge and its calculations, Atomic and ionic radii, ionisation energy **ORGANIC CHEMISTRY** **Geometrical isomerism:** Cause and conditions for geometrical isomerism, Nomenclature of geometrical isomers- cis and trans, E and Z system, Determination of configuration of geometrical isomers. **PHYSICAL CHEMISTRY** Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis), Expression for the rate constant based on equilibrium constant and thermodynamic aspects.	Lecture
4.	01-10-2026	31-10-2026	**INORGANIC CHEMISTRY** **Periodic Properties:** electron affinity and electronegativity– definition, methods of	Lecture and group discussion

			determination or evaluation. **<u>ORGANIC CHEMISTRY</u>** **Conformational Isomerism:** Representation of conformations - Sawhorse and Newman formulae, Conformational analysis of ethane, propane, n-butane, cyclohexane, **<u>PHYSICAL CHEMISTRY</u>** **Chemical Kinetics-II:** Catalysis and general characteristics of catalytic reactions, Homogeneous catalysis, acid-base catalysis and enzyme catalysis, including their mechanisms.	
	01-11-2026	17-11-2026	**<u>INORGANIC CHEMISTRY</u>** **Periodic Properties:** Trends in the periodic table and applications in predicting and explaining the chemical behaviour. **<u>ORGANIC CHEMISTRY</u>** **Conformational Isomerism:** Equatorial and Axial bonds. Conformations of Mono and di-substituted derivatives of cyclohexanes.	

			PHYSICAL CHEMISTRY **Chemical Kinetics-II:** Michaelis-Menten equation for enzyme catalysis and its mechanism.	

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
26h August, 2026	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
30th Sept, 2026	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
28th Oct, 2026	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
10th Nov, 2026	The teachers have completed the scheduled chapters and topics as shown in the lesson plan

***Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method

Lesson Plan

MCM DAV College for Women, Sector – 36 A, Chandigarh

Monthly Teaching Plans (Even Semester)

Session: 2026-27

Name of the Teacher: Dr. Shefali Dhiman, Dr. Sagarika Dev, Dr. Rishu

Department: Chemistry

Class: B.Sc. (2nd Semester) **Subject:** Chemistry

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1.	15-01-2027	31-01-2027	**INORGANIC CHEMISTRY** **Chemical Bonding I –** Covalent Bond – Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridisation and shapes of simple inorganic molecules and covalent ions. BeF2, BF3, CH4, PF5, SF6, IF7, SnCl2, XeF4 **ORGANIC CHEMISTRY** **Alkanes and Cycloalkanes** Structure, IUPAC Nomenclature and Isomerism, Methods of Preparation (Sabatier and Senderen's reaction, from	Lecture

			alkyl halide, Wurtz reaction, Corey House synthesis, Kolbe's method, decarboxylation), Physical and Chemical Properties. **PHYSICAL CHEMISTRY** **Gaseous States** Gas laws, Idea and real gases, postulates of kinetic theory of gases, deviation from ideal behavior, Van der Waal's equation of state, Critical Phenomena: PV isotherms of real gases, the isotherms of Van der Waal's equation, relationship between critical constants and Van der Waal's constants.	
2.	01-02-2027	28-02-2027	**INORGANIC CHEMISTRY** Valence shell electron pair repulsion (VSEPR) theory to H_3O^+, SF_4, ClF_3, ICl^- and H2O. MO theory, homonuclear (elements and ions of 1stand 2nd row), and heteronuclear (CN, CO^+, CO, CN^-), diatomic molecules, Percentage ionic character from dipole moment and electronegativity. **ORGANIC CHEMISTRY** Mechanism of Halogenation of Alkanes Relative reactivities of halogens, alkanes, and	Lecture and discussion

			different classes of Hydrogen atom; Orientation, Reactivity and Selectivity. Cycloalkanes, nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitation, ring strain in small rings (cyclopropane and cyclobutane), theory of strainless rings, the case of cyclopropane ring: banana bonds. **PHYSICAL CHEMISTRY** The law of corresponding states, reduced equation of state. MolecularVelocities: Root mean square, average and most probable velocities. Collision number, mean free path and collision diameter, Liquification of gases (based on Joule-Thomson effect).	
3.	01-03-2027	31-03-2027	**INORGANIC CHEMISTRY** **Chemical Bonding – II** Ionic Solids – Concept of close packing, Ionic structures (NaCl type, and Zinc blende), radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors. Lattice energy and Born-Haber cycle, solvation energy and solubility of	Lecture

			ionic solids, polarising power and polarisability of ions. **<u>ORGANIC CHEMISTRY</u>** **Stereochemistry and Optical Isomerism** Concept of Isomerism, Types of isomerism, Tetrahedral concept of carbon, Polarimetry, specific rotation. Optical isomerism- Elements of Symmetry, Molecular Chirality, Enantiomerism, stereogeniccentre, optical activity, chiral and achiral molecules with two stereogeniccentres, Diastereoisomers, Erythro and Threo isomers, Meso compounds. **<u>PHYSICAL CHEMISTRY</u>** **Thermodynamics-I** Definition of Thermodynamic Terms: System, surroundings, etc. Types of systems, intensive and extensive properties, State and path functions and their differentials. Thermodynamic process. Concept of heat and work. First Law of Thermodynamics: Statement, definition of internal energy and enthalpy.	

4.	01-04-2027	25-04-2027	**INORGANIC CHEMISTRY** Fajan's rule. Metallic bond-free electron, valence bond and band theories. Weak Interactions – Hydrogen bonding, Van der Waals forces. **ORGANIC CHEMISTRY** Representation of Stereoisomers Saw-horse, Newman, Flying edge and Fischer Projection. Number of stereoisomers in chiral compound, Racemisation, Internal and External compensation, Resolution of racemic mixture, Enantioselective synthesis, Walden inversion, Relative and absolute configuration, sequence rules, D & L and R & S system of nomenclature (with examples) **PHYSICAL CHEMISTRY** Heat capacity, heat capacities at constant volume and pressure and their relationship, Joule's Law-Joule-Thomson coefficient and inversion temperature. Calculations of w, q, dU and dH for the expansion of ideal gases under isothermal and adiabatic conditions for a reversible process.	Lecture and group discussion

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
27th January, 2027	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
24th February, 2027	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
24th March, 2027	The teachers have completed the scheduled chapters and topics as shown in the lesson plan
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans	
21st April, 2027	The teachers have completed the scheduled chapters and topics as shown in the lesson plan

***Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.Other Methods adopted by the teacher – Please write the specific teaching method