

B.A. Semester — II (MDC)

WEEK	TOPIC COVERED
05/01/2026-10/01/2026	UNIT-1 Classification of Elements and Periodic Properties Importance of classification of elements, overview and history of periodic system,
12/01/2026-17/01/2026	modern periodic law and periodic table, periodic properties of elements,
19/01/2026-24/01/2026	atomic and ionic size, ionization energy,
26/01/2026-31/01/2026	Electron affinity and electronegativity.
02/02/2026-07/02/2026	Unit-II Hydrocarbons and their Utility in Daily Life Introduction of hydrocarbons, classification of hydrocarbons,
09/02/2026-14/02/2026	Types of hydrocarbons (aliphatic and aromatic hydrocarbons).
16/02/2026-21/02/2026	Nomenclature, structure, physical properties of alkanes, alkenes and alkynes and their uses in everyday life.
23/02/2026-28/02/2026	Aromatic hydrocarbons- Nomenclature, structure of benzene,
09/03/2026-14/03/2026	Resonance and aromaticity. Combustion and pyrolysis,
16/03/2026-21/03/2026	Hydrocarbon as fuels (natural gas, petrol, LPG, kerosene, diesel and CNG.)
23/03/2026-28/03/2026	Unit-III Polymer Introduction to polymers, classification of polymers, natural and synthetic polymers,
30/03/2026-04/04/2026	biodegradable and non-biodegradable polymers,
06/04/2026-11/04/2026	methods of polymerization (addition and condensation polymers),
13/04/2026-18/04/2026	Preparation and use of polythene, nylon, PVC, teflon and bakelite.
20/04/2026-25/04/2026	Unit-IV Environmental Chemistry Causes and effects of air, water and soil pollution,
27/04/2026-02/05/2026	greenhouse effect and global warming, smog formation, acid rain,
04/05/2026-06/05/2026	depletion of ozone layer, pollution due to industrial waste, strategies to control environmental pollution.

B.Sc. 2nd DSC

WEEK	TOPIC COVERED
05/01/2026-10/01/2026	UNIT-1 Coordination Compounds Coordination compounds, ligands, coordination number, oxidation states, coordination entity, IUPAC nomenclature of coordination compounds,
12/01/2026-17/01/2026	isomerism in coordination compounds with coordination numbers 4 and 6.
19/01/2026-24/01/2026	Chelates and chelate effect, Valence bond theory and its application to complexes of coordination numbers 4 and 6.
26/01/2026-31/01/2026	Examples of inner and outer orbital complexes, limitations of VBT. Basic idea of Crystal field theory.
02/02/2026-07/02/2026	Unit-II Magnetic Properties of Transition Metal Complexes Types of magnetic behavior, methods of determining magnetic susceptibility,
09/02/2026-14/02/2026	spin-only formula. L-S coupling, correlation of μ_s and μ_{eff} values,
16/02/2026-21/02/2026	orbital contribution to magnetic moments, applications of magnetic moment data for 3d metal complexes.
23/02/2026-28/02/2026	Thermodynamic and Kinetic Aspects of Metal Complexes: A brief outline of

	thermodynamic stability of metal complexes and factors affecting the stability,
09/03/2026-14/03/2026	substitution reactions of square planar complexes of Pt (II).
16/03/2026-21/03/2026	Revesion of unit 1 or 2
23/03/2026-28/03/2026	Unit-III Kinetics and Chemical Equilibrium Integrated rate expression for first, second and third order reaction and their half-life period.
30/03/2026-04/04/2026	Methods of determination of order of reaction. Effect of temperature on the rate of reaction – Arrhenius equation.
06/04/2026-11/04/2026	Theories of reaction rate–Simple collision theory for unimolecular and bimolecular collision. Transition state theory of bimolecular reactions.
13/04/2026-18/04/2026	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 isochores, Van't Hoff reaction isotherm. Le-Chatelier's principle and its applications, Clapeyron equation and Clausius – Clapeyron equation & its applications.
20/04/2026-25/04/2026	Unit-IV Alcohols, Phenols and Ethers Alcohols: General methods of preparation using Grignard reagent, ester hydrolysis, reduction of aldehydes, ketones, carboxylic acid and esters. Reactions: with sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. KMnO4, acid. dichromate, con. HNO3).
27/04/2026-02/05/2026	Oppeneauer oxidation.Diols: Oxidation of diols. Pinacol-Pinacolone rearrangement. Phenols: Methods of preparation, physical properties and acidic character. Reactions: electrophilic substitution (nitration, halogenation and sulphonation).
04/05/2026-06/05/2026	Reimer-Tiemann reaction, Gattermann-Koch reaction, Houben-Hoesch condensation, Schotten-Baumann reaction. Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

B.Sc. 3rd

Organic chemistry & Physical Chemistry

WEEK	TOPIC COVERED
05/01/2026-10/01/2026	SECTION – (A) Organosulphur Compounds Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine. Synthetic detergents alkyl and aryl sulphonates.
12/01/2026-17/01/2026	Heterocyclic Compounds :- Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine.
19/01/2026-24/01/2026	Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole.
26/01/2026-31/01/2026	Introduction to condensed five and six- membered heterocycles. Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.

02/02/2026-07/02/2026	SECTION – B Organic Synthesis via Enolates Acidity of D-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.
09/02/2026-14/02/2026	Amino Acids, Peptides& Proteins Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of D-amino acids. Structure and nomenclature of peptides and proteins
16/02/2026-21/02/2026	Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid– phase peptide synthesis. <u>Structures of peptides and proteins: Primary & Secondary structure.</u>
23/02/2026-28/02/2026	Synthetic Polymers Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers.
09/03/2026-14/03/2026	Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. Natural and synthetic rubbers.
16/03/2026-21/03/2026	Section-A Electronic Spectrum Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck- Condon principle.
23/03/2026-28/03/2026	Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions.
30/03/2026-04/04/2026	Photochemistry Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Drapper law, StarkEinstein law (law of photochemical equivalence)
06/04/2026-11/04/2026	Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples).
13/04/2026-18/04/2026	Section-B Solutions Dilute Solutions and Colligative Properties Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution,Colligative properties, Raolut's law, relative lowering of vapour pressure, molelcular weight determination, Osmosis law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure
20/04/2026-25/04/2026	Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes.
27/04/2026-02/05/2026	Phase Equilibrium Statement and meaning of the terms – phase component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water and Sulpher systems.
04/05/2026-06/05/2026	Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilverisation of lead