

Lesson Plan
Session: 2025-26

Name of the Assistant Professor: Dr Som Sharma

Class: B.Sc. 4th semester

Subject: Chemistry

Paper : DSC Chemistry

Credit: 4

Dates	Week	Topic
06.01.2026 to 10.01.26	1	Chemistry of d-block elements Definition of transition elements, position in the periodic table, General characteristic properties of d-Block elements,
12.01.2026 to 17.01.26	2	Comparison of properties of 3d elements with 4d and 5d elements with reference only to ionic radii, oxidation state, magnetic and spectral properties, and stereochemistry
19.01.2026 to 24.01.26	3	. Stability of various oxidation states, Structure and properties of some compounds of transition elements- $Ni(CO)_4$, $CuCl_2$, $VOCl_2$, TiO_2 , $FeCl_3$
27.01.2026 to 31.01.26	4	Werner's theory of coordination compounds, effective atomic number, chelates, nomenclature of coordination compounds, Isomerism in coordination compounds, valence bond theory of transition metal complexes
02.02.2026 to 07.02.26	5	Second law of thermodynamics, concept of entropy, entropy as a function of Volume & Temperature, entropy as a function of Pressure & Temperature, entropy as a criterion of spontaneity and equilibrium
09.02.2026 to 14.02.26	6	Entropy changes in ideal gases and mixing of gases.
16.02.2026 to 21.02.26	7	Gibbs and Helmholtz functions: Gibbs function (G), and Helmholtz function (A) as a thermodynamic quantity
23.02.2026 to 28.02.26	8	G & A as criteria for thermodynamic equilibrium and spontaneity, variation of G and A with P & V, Van't Hoff reaction isotherm

Dates	Week	Topic
09.03.2026 to 14.03.26	9	Electrochemistry-II Conventional representation of electrochemical cells, EMF of a cell and its measurement, Weston standard cell, activity, Calculation of thermodynamic quantities of cell reaction (ΔG , ΔH , K)
16.03.2026 to 21.03.26	10	Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential, Standard Hydrogen Electrode, reference electrodes, standard electrode potentials, sign conventions, electrochemical series and its applications.
23.03.2026 to 28.03.26	11	Unit-III Alcohols Monohydric alcohols: methods of formation: by reduction of aldehydes, ketones, carboxylic acids, and esters. Hydrogen bonding, Acidic nature, Reactions of alcohols. MID TERM EXAM
30.03.2026 to 04.04.26	12	Dihydric alcohols — methods of formation, chemical reactions of vicinal glycols, oxidative cleavage by using $[Pb(OAc)_4]$ and HIO_4 and pinacol-pinacolone rearrangement.
06.04.2026 to 11.04.26	13	Phenols Structure and bonding, Preparation of phenols, physical properties and acidic character, Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.
13.04.26 To 18.04.26	14	Reactions of phenols — electrophilic aromatic substitution, Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction
20.04.2026 to 25.04.26	15	Aldehydes and Ketones Structure of aldehydes and ketones, Methods of preparation: aldehydes from acid chlorides and from nitriles, advantage of oxidation of alcohols, comparison of reactivity of aldehydes and ketones,
27.04.2026 to 05.05.26	16	Mechanism of nucleophilic additions to carbonyl compounds with particular emphasis on Aldol, Benzoin, Perkin condensations. Wittig reaction, Mannich Reaction, MPV, Clemmensen and Wolff-Kishner reductions. Revision

Som Sharma
Signature

Lesson Plan
Session: 2025-26

Name of the Assistant Professor: Som Sharma

Class: B.Sc3rd Year

Subject: Chemistry

Paper: Inorganic Chemistry

	Week	Topics
06.01.2026 to 10.01.26	1	Electronic Spectrum Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck- Condon principle.
12.01.2026 to 17.01.26	2	Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions. Photochemistry Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry
19.01.2026 to 24.01.26	3	Grotthus-Drapper law, Stark-Einstein lavn, (law of photochemical equivalence) Jablonski diagram depicting Various processes occurring in the excited state, fluorescence, phosphorescence,
27.01.2026 to 31.01.26	4	Non-radiative processes (internal conversion, intersystem crossing), Numericals
02.02.2026 to 07.02.26	5	Quantum yield, photosensitized ractions-energy transfer processes (simple examples).

	Week	Topics
09.02.2026 to 14.02.26	6	SESSIONAL TEST . Preparation of -amino acids. selective hydrolysis of peptides. peptide synthesis. Structures of peptides and proteins: Primary & Secondary structure point and electrophoresis. Preparation of -amino acids. Structure and nomenclature of peptides and proteins. Classification
16.02.2026 to 21.02.26	7	Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis,
23.02.2026 to 28.02.26	8	Polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy resins and polyurethanes. ASSIGNMENT

09.03.2026 to 14.03.26	9	Synthetic Polymers Addition or chain-growth polymerization' Free radical vinyl polymerization, ionic vinylpolymerization,
16.03.2026 to 21.03.26	10	Ziegler-Natta polymerization and vinyl polymers. Condensation or step growth polymerization. Polyesters,
23.03.2026 to 28.03.26	11	Natural and synthetic rubtrers.of alkyl halides vsallyl, vinyl and aryl halides.

Paper: Organic Chemistry

	Week	Topics
30.03.2026 to 04.04.26	12	Nomenclature" structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, Sulphonamides and sulphaguanidine. Synthetic detergents alkyl and sulphonates.
06.04.2026 to 11.04.26	13	Heterocyclic Compounds Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine.
13.04.26 To 18.04.26	14	Methods of synthesis and chemical reactions of hetrocyclic compounds with particular emphasis on the mechanism.
20.04.2026 to 25.04.26	15	Organic Synthesis viu Enolates Acidity of -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate.
27.04.2026 to 05.05.26	16	Synthesis of ethyl acetoacetate: REVISION

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Signature