Government College for Women, Hisar
Lesson Plan for Even Semester (2025-26)
Department: Chemistry

Class: B.Sc. I; Semester-2nd;
Course: Value Aided Courses (VAC)
Paper: Chemistry in Daily Life (Semester-I/II) Code: C24VAC111T
Name of Teachers: Dr.Satyender Kumar, Dr. Rakesh Kumar, Dr. Priyanka

Week	Contents
Week 1	**Soaps and Detergents** Cleansing action of soap, Cleansing action of detergents
Week 2	**Propellants** Solid propellant, liquid propellants
Week 3	Hybrid propellants
Week 4	**Dyes** Cause of exhibition of color,
Week 5	Chromospheres, auxochrome
Week 6	Classification of dyes
Week 7	Discussion and Problem taken
Week 8	Revision and Class test
Week 9	**Types of Medicines** Definition with examples of- Antipyretics
Week 10	Analgesics, Antidepressants
Week 11	Antiseptics and disinfectants
Week 12	Antiviral drugs, Antacids
Week 13	Ant malarial, Anaesthetics, Tranquilizers
Week 14	Hypnotics and sedatives.
Week 15	Antiallergic drugs and Histamines
Week 16	Revision.

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Government College for Women, Hisar
Lesson Plan for Even Semester (2025-26)
Department: Chemistry

Class: B.Sc. II; Semester-4th;
Course: Minor Course(MIC/ VOC)
Paper: Basic Chemistry -IV, Code: C24MIC431T
Name of Teacher: Dr. Satyender Kumar

Week	Contents
Week 1	**Cosmetics-** Definition, Classification
Week 2	Ingredients, Constituents of Cosmetics
Week 3	A general study of cosmetics
Week 4	Preparation and uses of- soaps
Week 5	Hair dyes
Week 6	Hair lighteners or bleaches
Week 7	Hair removers
Week 8	Shampoos
Week 9	**Preparation and uses-** Face powder
Week 10	Talcum powder
Week 11	Cold and vanishing creams
Week 12	Shaving creams
Week 13	Antiperspirants
Week 14	Artificial flavors
Week 15	Revision

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LESSON PLAN (2025-26)

Class: B.Sc. 6th Sem (Non-Med., Med.)

CCL-604(i)
Discipline Specific Course-IV(i)
POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

Teacher's Name- Dr. Satyender Kumar

	Content
Week 1	**Polynuclear and heteronuclear aromatic compounds:** Properties of the Naphthalene with reference to electrophilic substitution.
Week 2	Properties of the Naphthalene with reference to nucleophilic substitution.
Week 3	Properties of the Anthracene with reference to electrophilic and nucleophilic substitution
Week 4	Properties of the Furan with reference to electrophilic and nucleophilic substitution
Week 5	Properties of the Pyrrole with reference to electrophilic and nucleophilic substitution
Week 6	Properties of the Thiophene, and Pyridine with reference to electrophilic and nucleophilic substitution
Week 7	**Active methylene compounds:** *Preparation:* Claisen ester condensation
Week 8	Keto-enol tautomerism
Week 9	*Reactions:* Synthetic uses of ethyl acetoacetate (preparation of non-hetero molecules having upto 6 carbon).
Week 10	Application of Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and infrared spectroscopy in organic molecules
Week 11	Electromagnetic radiations, electronic transitions, λ max& ε max,
Week 12	Chromophore, auxochrome, bathochromic and hypsochromic shifts
Week 13	Application of electronic spectroscopy and Woodward rules for calculating λ max of conjugated dienes and α,β-unsaturated compounds .
Week 14	Infrared radiation and types of molecular vibrations ,functional group and fingerprint region
Week 15	IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions
Week 16	Revision

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Department of Chemistry
Lesson Plan
Session 2025-26

Name of Assistant Professor: Dr. Rakesh Kumar

Class: B. Sc. 1st (Semester-2nd) Life Science and Physical Science

Paper Name: Chemistry – II

Paper Code: C24CHE201T

Week	Dates	Topics to be Covered
Week 1	12 – 17 Jan. 2026	**UNIT-I** **Covalent Bond** Valence bond theory approach.
Week 2	19 – 24 Jan. 2026	Various type of hybridization and shapes of simple inorganic molecules and ions with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{2-}, ClO_4^-, NO_3^-).
Week 3	26 – 31 Jan. 2026	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^-.
Week 4	2 – 7 Feb. 2026	**UNIT-II** **Alkanes** Nomenclature, Classification of carbon atoms in alkanes and its structure. Isomerism in alkanes. Methods of Preparation: Wurtz reaction and Corey-House reaction.
Week 5	9 – 14 Feb. 2026	Kolbe electrolytic reaction, and decarboxylation of carboxylic acids. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.
Week 6	16 – 21 Feb. 2026	**Alkenes** Nomenclature of alkenes and its structure. Methods of Preparation: dehydration of alcohols and dehydrohalogenation of alkyl halide with mechanism.
Week 7	23 – 28 Feb. 2026	The Saytzeff rule and relative stabilities of alkenes. Chemical reactions: electrophilic and free radical additions: addition of halogens, halogen acids, hydroboration–oxidation, ozonolysis. **Class Test & Assignment**
Week 8	1 – 7 March 2026	**No Classes Holi Break**
Week 9	9 – 14 March 2026	**Alkynes** Nomenclature, structure and bonding. Methods of Preparation: From Calcium carbide and from acetylene. Chemical reactions: Acidity of terminal alkynes, Cause of acidity, Reactivity of alkenes versus alkynes towards electrophilic addition reaction.
Week 10	16 – 21 March 2026	**UNIT-III**

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		Chemical Kinetics Concept of reaction rates, Rate equation, Rate law, Law of mass action, Factors influencing the rate of reaction, Order and molecularity of a reaction,
Week 11	**23 – 28 March 2026**	Derivation of Integrated rate expression for zero, first and second order reaction (for equal concentration of reactants),
Week 12	**30 March – 4 April 2026**	Half-life period of a reaction, Methods of determination of order of a reaction, Concept of Activation Energy and its calculation from Arrhenius equation.
Week 13	**6 – 11 April 2026**	**UNIT-IV** **Thermodynamics** Definition of various thermodynamic terms: Types of systems, Intensive and Extensive properties. State and path functions. Thermodynamic process. Thermodynamic equilibrium, First law of thermodynamics:
Week 14	**13 – 18 April 2026**	Concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship.
Week 15	**20 – 25 April 2026**	Second law of thermodynamics, Carnot's cycle and its efficiency, Carnot's theorem. Gibbs function (G) and Helmholtz function (A), G as criteria for thermodynamic equilibrium and spontaneity.
Week 16	**27 – 30 April 2026**	Concept of entropy. Third law of thermodynamics: Nernst heat theorem, concept of residual entropy **Class Test & Assignment**

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Assistant Professor (Chemistry)
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Lesson Plan
Session 2025-26

Name of Assistant Professor: Dr. Rakesh Kumar

Class: B. Sc. 2nd (Semester-4th) Life Science and Physical Science

Paper Name: Chemistry – IV

Paper Code: C24CHE401T

Week	Dates	Topics to be Covered
Week 1	5 – 10 Jan. 2026	**Coordination Chemistry and Crystal Field Theory** Valence Bond Theory (VBT): Inner and outer orbital complexes of Cr. Fe. Co. Ni and Cu (coordination numbers 4 and 6). Drawbacks of VBT. Assumptions of CFT. ,
Week 2	12 – 17 Jan. 2026	Crystal field splitting in octahedral geometry Crystal field stabilization energy (CFSE). Crystal field effects for weak and strong fields. Tetrahedral symmetry.
Week 3	19 – 24 Jan. 2026	Crystal field splitting in Tetrahedral symmetry, Factors affecting the magnitude of d-orbital splitting Spectrochemical series,
Week 4	26 – 31 Jan. 2026	Comparison of CFSE for Oh and Td complexes, Tetragonal distortion of octahedral geometry, John Teller distortion, square planar coordination.
Week 5	2 – 7 Feb. 2026	**UNIT-II** **Aldehydes and Ketones** Structure and nature of carbonyl group: Preparation from acid chlorides (aldehydes), from nitriles and dialkyl cadmium (ketones).
Week 6	9 – 14 Feb. 2026	Special methods (Collin's reagent. PCC. PDC). Reactions – Iodoform test. Aldol Condensation (base catalysed). Benzoin condensation. Wittig reaction.
Week 7	16 – 21 Feb. 2026	Clemmensen reduction. Wolff Kishner reduction. Cannizzaro's reaction.
Week 8	23 – 28 Feb. 2026	Meerwein-Pondorff Verley reduction and Baeyer-Villiger oxidation (with mechanism). Relative reactivities of aldehydes and ketones in nucleophilic addition reactions. **Class Test & Assignment**
Week 9	1 – 7 March 2026	**No Classes Holi Break**
Week 10	9 – 14 March 2026	**UNIT-III** **Electrochemistry** Concept of EMF of a cell, Measurement of EMF, Nernst equation and its importance, types of electrodes, standard electrode potential, electrochemical series,
Week 11	16 – 21 March 2026	thermodynamics of a reversible cell, calculation of thermodynamic properties: G, H, S from EMF data, calculation of equilibrium constant from EMF data,
Week 12	23 – 28 March 2026	concentration cell with transference and without transference, liquid junction potential and salt bridge,
Week 13	30 March – 4 April 2026	pH determination using hydrogen electrode, quinhydrone electrode, glass electrode.
Week 14	6 – 11 April 2026	**UNIT-IV** **Liquid and Solid State** **Liquids:** Properties of liquids- Surface tension, Viscosity.

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		Refractive index.
Week 15	**13 – 18 April 2026**	Measurement Methods: Surface Tension - Stalagmometer (Drop Number Method). Viscosity - Ostwald's Viscometer. Refractive Index - Abbe's Refractometer.
Week 16	**20 – 25 April 2026**	**Solids:** Forms of solids. Symmetry elements. Unit cells. Crystal systems. Bravais lattice types. Laws of Crystallography - Law of constancy of interfacial angles.
Week 17	**27 – 30 April 2026**	Law of rational indices. Miller indices. X–Ray diffraction by crystals. Bragg's law. Structures of NaCl, KCl and CsCl (qualitative treatment only). **Class Test & Assignment**

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Dr Priyanka

Class BA & BCom (2nd semester)

Multidisciplinary Course (MDC)

Chemistry of Oils and Dyes – Semester I

Lesson Plan

Paper Code: C24MDC104T

Credits: 2 | Total Hours: 30 (2 Hrs/Week)

Week	Date	Unit	Topics
Week 1	22–28 Jan	Unit I	Introduction to oils and fats; classification
Week 2	29 Jan–4 Feb	Unit I	Common fatty acids present in oils and fats
Week 3	5–11 Feb	Unit I	Difference between fats and oils
Week 4	12–18 Feb	Unit I	Saponification value, acid value, iodine value (definitions)
Week 5	19–28 Feb	Unit I	Applications and uses of different oils and fats
Week 6		Unit I	Revision / Unit test
Week 7	1–08Mar	-	Holi Holidays
Week 8	9–17 Mar	Unit II	Definition of dyes; colour and constitution
Week 9	18–24 Mar	Unit II	Classification of dyes based on origin and application
Week10	25–31 Mar	Unit II	Methyl orange (azo dye); Malachite green
Week11	1–7 Apr	Unit II	Phenolphthalein; Alizarin
Week12	8–14 Apr	Unit II	Indigo dye: preparation, properties and uses
Week13	15–21 Apr	Unit II	Applications and uses of dyes
Week14	22–30 Apr	Both Units	Overall revision and internal assessment

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Chemistry Department

Even Semester Lesson Plan

Class: BSc III NM, BSc III Med

Paper: CCL-603(i)

Discipline Specific Course-III(i)

Subject: Organometallics and Bioinorganic Chemistry

Duration: 6 January to 30 April

Week	Date	Month	Topic
Week 1	6–12 Jan	January	Chemistry of 3d metals; Oxidation states of Cr, Fe, Co, Ni
Week 2	13–19 Jan	January	Peroxo compounds of Cr; $K_2Cr_2O_7$, $KMnO_4$
Week 3	20–26 Jan	January	$K_4[Fe(CN)_6]$, Sodium nitroprusside
Week 4	27 Jan–2 Feb	January	$[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$
Week 5	3–9 Feb	February	Organometallic compounds: definition & classification
Week 6	10–16 Feb	February	Metal–carbon bond types; methyl lithium, Zeiss salt
Week 7	17–23 Feb	February	Ferrocene structure; EAN rule & carbonyls
Week 8	24 Feb–2 Mar	February	Revision / Internal assessment
Week 9	3–9 Mar	March	Holi Break
Week 10	10–16 Mar	March	Mononuclear carbonyls: preparation, structure & bonding
Week 11	17–23 Mar	March	Polynuclear carbonyls; p-acceptor behaviour of CO
Week 12	24–30 Mar	March	Synergic effect; IR frequencies
Week 13	31 Mar–6 Apr	April	Introduction to Bio-inorganic chemistry
Week 14	7–13 Apr	April	Role of Na^+, K^+ ions; Na/K pump
Week 15	14–20 Apr	April	Role of Mg^{2+} ions; chlorophyll & energy production
Week 16	21–30 Apr	April	Role of Ca^{2+}; blood clotting & protein stabilization

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LESSON PLAN

Course: B.Sc (Chemistry)

Paper: Chemical Kinetics & Ionic Solids

Teacher : Dr Priyanka

Class: B.Sc 1st (sem 2nd)

UNIT – I: CHEMICAL KINETICS

Week	Dates	Topics to be Covered
Week 1	5 – 10 Jan 2026	Introduction to Chemical Kinetics, Concept of reaction rates, Average & instantaneous rate, Units of rate
Week 2	12 – 17 Jan 2026	Rate equation, Rate law, Rate constant, Law of Mass Action
Week 3	19 – 24 Jan 2026	Factors influencing rate: Concentration, Temperature, Catalyst, Surface area, Nature of reactants
Week 4	26 – 31 Jan 2026	Order of reaction, Molecularity, Difference between order & molecularity, Experimental determination of order
Week 5	2 – 7 Feb 2026	Integrated rate expression – Zero order reaction (derivation & numericals)
Week 6	9 – 14 Feb 2026	First order reaction (derivation & numericals), Graphical representation
Week 7	16 – 21 Feb 2026	Second order reaction (equal concentration case), Comparison of different orders
Week 8	23 – 28 Feb 2026	Half-life of zero, first & second order reactions; Numerical problems; **Class Test I**

Week	Dates	Topics to be Covered
Week 9	1 – 7 March 2026	**No Classes Holi Break**
Week 10	9 – 14 March 2026	Arrhenius Equation, Temperature dependence of rate, Arrhenius plot
Week 11	16 – 21 March 2026	Determination of Activation Energy, Numerical problems, Revision of Unit I

UNIT – II: IONIC SOLIDS

Week	Dates	Topics to be Covered
Week 12	23 – 28 March 2026	General characteristics of ionic bonding, Lattice energy, Solvation energy, Stability & solubility
Week 13	30 March – 4 April 2026	Statement of Born–Landé equation (Derivation excluded), Born–Haber cycle & applications
Week 14	6 – 11 April 2026	Polarizing power, Polarizability, Fajan's rules, Ionic character in covalent compounds
Week 15	13 – 18 April 2026	Bond moment, Dipole moment, Percentage ionic character, Numerical problems
Week 16	20 – 25 April 2026	Crystal Defects – Schottky, Frenkel, Non-stoichiometric defects; Effects on properties
Week 17	27 – 30 April 2026	Full syllabus revision, Important numericals, Previous year questions, **Class Test II**

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