

Lesson plans of Chemistry Department

Name of the Faculty : Mr. GURDEEP
Discipline : B.SC- II (Physical science)
Semester : Semester-III
Subject : (Inorganic, Physical , Organic) Chemistry
Lesson Plan duration: From August 2026 to Nov. 2026

Week/Month	Name of Topics
August	• s and p-Block Elements • Salient features of hydrides, oxides, halides, hydroxides of s-block elements (methods of preparation excluded). • Structure, preparation and properties of Diborane and Borazine. • Catenation, carbides, fluorocarbons, silicates (structural aspects), structure of oxides of Nitrogen and Phosphorous, structure of white and red phosphorus. • Structure of oxyacids of Nitrogen, phosphorous, sulphur and chlorine and comparison of acidic strength of oxyacids. • low chemical reactivity of noble gases, chemistry of xenon, structure and bonding in fluorides, oxides and oxyfluorides of xenon.
September	• Electrochemistry-I • Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution (Numericals) • Concepts of pH and pK_a, Buffer solution, Buffer action, Henderson – Hazel equation, Buffer mechanism of buffer action. • Electrochemistry-II • Reversible & irreversible cells, Calculation of thermodynamic quantities of cell reaction (ΔG, ΔH & K). • Types of reversible electrodes – metal- metal ion, gas electrode, metal – insoluble salt- anion and redox electrodes. Nernst equation, Standard Hydrogen electrode, reference electrodes, Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode.

October	• Alkynes • Nomenclature and its structure. Methods of formation: using Calcium carbide, dehydrohalogenation, Kolbe's electrolysis. Chemical reactions: Mechanism of electrophilic and nucleophilic addition reactions, formation of metal acetylides, addition of bromine and alkaline KMnO₄, ozonolysis. Acidity of alkynes. • Stereochemistry of Organic Compounds • Concept of isomerism: Structural and Stereoisomerism. Symmetry elements, enantiomers, optical activity, properties of enantiomers, chiral and achiral molecules (up-to 2 asymmetric centres), diastereomers, threo- and erythro- nomenclature, meso-compounds, Relative and absolute configuration, sequence rules, R and S system of nomenclature. Cis- Trans isomerism, E & Z system of nomenclature, Conformational analysis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman and Sawhorse projection formulae.
November	• Benzene and its derivatives: • Nomenclature, Aromatic nucleus and side chain, Huckels' rule of aromaticity. • Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel- Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. • Alkyl halides: Nomenclature, methods of formation: from alkenes and alcohol, nucleophilic substitution reactions of alkyl halides, SN₂ and SN₁ reactions with energy profile diagrams. • Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. The addition-elimination, and the elimination- addition mechanisms of nucleophilic aromatic substitution reactions. • Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides.
.	Assignment and Class tests

Name of the Faculty : **Mr. GURDEEP**
Discipline : **B.SC- I (MINOR.)**
Semester : **Semester-I**
Subject : **Chemistry**
Lesson Plan duration: **From. August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	I. Covalent Bond Contact Hours: 4 This unit covers the shapes of simple inorganic molecules and ions based on Valence Shell Electron Pair Repulsion (VSEPR) theory and hybridization. It includes suitable examples of various geometries such as linear, trigonal planar, square planar, and tetrahedral arrangements.
September	II. Chemical Kinetics Contact Hours: 4 This section deals with the concept of reaction rates, factors influencing the rate of reaction, order and molecularity of a reaction, and integrated rate expressions for zero and first-order reactions.
October	III. Alkanes (up to 5 carbon atoms) Contact Hours: 4 Topics include nomenclature, classification of carbon atoms in alkanes, isomerism in alkanes, and various methods of formation such as Wurtz reaction, Kolbe reaction, Corey-House reaction, and decarboxylation of carboxylic acids.
November	IV. Metallic Bond and Semiconductors Contact Hours: 3 This unit introduces the metallic bond and provides a qualitative idea of band theory of metallic bonding, distinguishing between conductors, semiconductors, and insulators. and Assignments and Class tests

Name of the Faculty : **Ms. Priya**
Discipline : **B.Sc- II (SEC)**

Semester : **Semester-III**

Subject : **Chemistry**

Lesson Plan duration: **From August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	Present Laws and Procedures on Adulteration Rights of Food Safety and Standards Act 2006 (FSSA)
September	-Food Safety and Standards Authority of India-Rules and Procedures of Local Authorities.
October	Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies. Private testing laboratories. Quality control laboratories of consumer co-operatives..
November	Consumer education, Consumer's problems rights and responsibilities, COPRA 2019-Offenses and Penalties - Procedures to Complain - Compensation to Victims
.	Assignment and Class tests

Name of the Faculty : **Ms. Priya**
Discipline : **B.A- I (MDC)**

Semester : **Semester-I**

Subject : **Chemistry**

Lesson Plan duration: **From August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	Atomic Structure and Bonding Introduction, Elementary introduction of atomic structure and chemical bonding, Representation of elements/ atoms, Lewis structure, electronic configurations
September	Carbon and Its Compounds Introduction, Tetravalency of Carbon, allotropes of carbon and their properties, hydrocarbons (1-5), nomenclature (linear compounds), Applications of hydrocarbons.
October	Polymers Introduction, elementary idea of synthetic and natural polymers, Homopolymers and copolymers, uses and properties (Natural rubber, Vulcanized rubber, Polyethene, PVC, Styrene, Teflon, PAN, Nylon-66)
November	Food Preservatives Elementary idea of natural and synthetic food preservatives, rancidity, uses and properties, different food preservation processes (pickle, Jam), artificial sweeteners, uses and properties
.	Assignment and Class tests

Name of the Faculty : **Ms. Priya**
Discipline : **B.Sc- III (VOC)**

Semester : **Semester-V**

Subject : **Chemistry**

Lesson Plan duration: **From August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	Cosmetics-Definition, History, Classification, Ingredients, Nomenclature, A general study including preparation and uses of the following: Hair dye, Hairspray, Shampoo, conditioners, Suntan lotions.
September	Preparation and uses of Face powder, Lipsticks, Talcum powder, Nail enamel.
October	Preparation and uses of creams (cold, vanishing, and shaving creams), Antiperspirants and Artificial flavours.
November	Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol, Sandal wood oil, Eucalyptus, Rose oil, 2-Phenylethyl alcohol, Jasmone, Civetone, Muscone
.	Assignment and Class tests

Lesson plans of Chemistry Department

Name of the Faculty : Mrs. Suman lata
Discipline : B.SC- II (Life science)

Semester : Semester-III

Subject : Chemistry

Lesson Plan duration: From August 2026 to Nov. 2026

Week/Month	Name of Topics
August	• s and p-Block Elements • Salient features of hydrides, oxides, halides, hydroxides of s-block elements (methods of preparation excluded). • Structure, preparation and properties of Diborane and Borazine. • Catenation, carbides, fluorocarbons, silicates (structural aspects), structure of oxides of Nitrogen and Phosphorous, structure of white and red phosphorus. • Structure of oxyacids of Nitrogen, phosphorous, sulphur and chlorine and comparison of acidic strength of oxyacids. • low chemical reactivity of noble gases, chemistry of xenon, structure and bonding in fluorides, oxides and oxyfluorides of xenon.
September	• Electrochemistry-I • Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution (Numericals) • Concepts of pH and pK_a, Buffer solution, Buffer action, Henderson – Hazel equation, Buffer mechanism of buffer action. • Electrochemistry-II • Reversible & irreversible cells, Calculation of thermodynamic quantities of cell reaction (ΔG, ΔH & K). • Types of reversible electrodes – metal- metal ion, gas electrode, metal – insoluble salt- anion and redox electrodes. Nernst equation, Standard Hydrogen electrode, reference electrodes, Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode.

October	• Alkynes • Nomenclature and its structure. Methods of formation: using Calcium carbide, dehydrohalogenation, Kolbe's electrolysis. Chemical reactions: Mechanism of electrophilic and nucleophilic addition reactions, formation of metal acetylides, addition of bromine and alkaline KMnO₄, ozonolysis. Acidity of alkynes. • Stereochemistry of Organic Compounds • Concept of isomerism: Structural and Stereoisomerism. Symmetry elements, enantiomers, optical activity, properties of enantiomers, chiral and achiral molecules (up-to 2 asymmetric centres), diastereomers, threo- and erythro- nomenclature, meso-compounds, Relative and absolute configuration, sequence rules, R and S system of nomenclature. Cis- Trans isomerism, E & Z system of nomenclature, Conformational analysis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman and Sawhorse projection formulae.
November	• Benzene and its derivatives: • Nomenclature, Aromatic nucleus and side chain, Huckels' rule of aromaticity. • Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel- Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. • Alkyl halides: Nomenclature, methods of formation: from alkenes and alcohol, nucleophilic substitution reactions of alkyl halides, SN₂ and SN₁ reactions with energy profile diagrams. • Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. The addition-elimination, and the elimination- addition mechanisms of nucleophilic aromatic substitution reactions. • Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides.
.	Assignment and Class tests

Name of the Faculty : **Mrs. Suman lata**
Discipline : **B.SC- I (Life science)**
Semester : **Semester-I (SEC)**
Subject : **Chemistry**
Lesson Plan duration: **From August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	Biological molecules in food Water: Physical properties: specific heat, latent heat, vapor pressure, boiling point, water as dispersing medium, states of water, Water in food preparation and preservation Starch: Structure, functional properties Gelatinization, pasting, syneresis, retrogradation, dextrinization. Factors affecting gelatinization and gelation, c) Gums Functions, sources, applications. d) Pectic substances, pectin gels
September	Enzymes: a) Biocatalysts, enzyme specificity b) Use of exogenous enzymes in foods amylases, lipases, proteases c) Endogenous enzymes phenol oxidases, peroxidases, oxido-reductases, lipoxygenases d) Freezing enzyme activity
October	Flavours & Pigments Flavours: a) Molecular mechanism of flavor perception (sweet, bitter, salty, sour, umami, kokumi, pungent, cooling and astringent) b) Flavours from vegetables, fruits, spices, fats and oils, milk and meat products Pigments: a) Pigments in Animal and Plant tissues (carotene compounds, Chlorophyll, Carotenoids, Anthocyanins, Betalains) b) Synthetic Food Colors (toxicity and regulatory aspects).
November	Additives: a) Buffer systems, and salts, chelating agents b) Antioxidants c) Antimicrobials d) Fat replacers, sweeteners e) Masticatory substances f) Extensifiers g) Clarifying agents, bleaching agents h) Flour improvers, anti-caking agents, i) Gases and propellants. Color Natural and synthetic food colors, their chemical structure, shades imparted, stability, permitted list of colors, usage levels and

	food application.
.	Assignment and Class tests

Name of the Faculty : **Mrs. Suman lata**
Discipline : **B.A- II (VAC)**

Semester : **Semester-III**

Subject : **Chemistry**

Lesson Plan duration: **From August 2026 to Nov. 2026**

Week/Month	Name of Topics
August	Introduction: Social and cultural construction of 'environment'; environmental thought from historical and contemporary perspective in light of the concepts of Gross Net Happiness and Aldo Leopold's Land Ethic Issues in Environmentalism: Significant global environmental issues such as acid rain, climate change, and resource depletion; historical developments in cultural, social and economic issues related to land, forest, and water management in a global context: interface between environment and society.
September	Development -Environment Conflict: Developmental issues and related impacts such as ecological degradation; environmental pollution; development-induced displacement, resettlement, and rehabilitation: problems, concerns, and compensative mechanisms; discussion on Project Affected People (PAPS). Urbanization and environment: Production and consumption oriented approaches to environmental issues in Indian as well as global context; impact of industry and technology on environment; urban sprawl, traffic congestion and social-economic problems; conflict between economic and environmental interests.
October	Environment and Social Inequalities: Inequalities of race, class, gender, region, and nation-state in access to healthy and safe environments; history and politics surrounding environmental, ecological and social justice; environmental ethics, issues and possible solutions. Regulatory Framework: Brief account of Forest Conservation Act 1980 1988; Forest Dwellers Act 2008; Land Acquisition Act 1894, 2007, 2011, 2012; Land Acquisition Rehabilitation and Resettlement Act 2013

November	Community Participation: State, corporate, civil society, community, and individual-level initiatives to ensure sustainable development; case studies of environmental movements (Appiko Movement. Chipko Movement, Narmada Bachao Andolan): corporate responsibility movement; appropriate technology movement, citizen groups; role played by NGOs, environmental education and awareness
.	Assignment and Class tests

Name of the Faculty : Mrs. Suman lata

Discipline : B.Sc- II (SEC)

Semester : Semester-III

Subject : Chemistry

Lesson Plan duration: From August 2026 to Nov. 2026

Week/Month	Name of Topics
August	Common Foods and Adulteration Common Foods subjected to Adulteration Adulteration Definition Types: Poisonous substances,.
September	Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives Intentional and incidental. General Impact on Human Health
October	Adulteration of Common Foods and Methods of Detection Means of Adulteration, Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices,
November	Processed food, Fruits and vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).

.	Assignment and Class tests
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Name of the Faculty : **Mr. Surender Kumar**
Discipline : **B.SC- III (Physical Science + Life Science)**
Semester : **Semester-V**
Subject : **CHEMISTRY**
Lesson Plan duration : **From August 2026 to Nov 2026**

Week/Month	Name of Topics
August	Organic Synthesis via Enolates Acidity of α-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate Quantum Mechanics-I: Black body radiation, plank's radiation law, Explanation of spectral distribution of black body radiation on the basis of classical mechanics and quantum mechanics, Heat capacity of solids, Need of quantum mechanics, postulates of quantum mechanics, quantum mechanical operator Commutation relations, Hamiltonian operator, Role of operators to derive Schrodinger wave equation, Application Schrodinger wave equation in determination of wave function and energy of a particle in one dimensional box
Sept.	Coordination Compounds: Werner's theory of coordination compounds, EAN, chelates, nomenclature of coordination compounds, isomerism in coordination compounds Metal Ligand Bonding in Transition Metal Complexes: Valence bond theory, applications and their Limitation, Elementary idea of CFT (Only structural aspects), Crystal field splitting in octahedral, tetrahedral and square planer complexes. Magnetic properties of transition metal complexes: Types of magnetic materials, magnetic susceptibility, method of determination, spin only formula, basic idea of L-S coupling Spectroscopy-I: Electromagnetic radiations, reasons of electromagnetic spectrum, basic features of spectroscopy,

	introduction to molecular spectroscopy and its difference from atomic spectroscopy, signal to noise ratio, resolving power of spectrophotometer, Born-Oppenheimer approximation, Concept of degree of freedom
Oct.	Rotational Spectrum: Energy levels of rigid rotator of diatomic molecules, selection rules, spectral intensity distribution using Maxwell-Boltzmann distribution, Determination of bond length and concept of isotopic effect Phase Equilibria: Statement and the meaning of terms-phase component and degree of freedom, Thermodynamic derivation of Gibbs phase rule, Phase equilibria of one component system-water system, phase equilibria of two component systems solid-liquid equilibria, simple Eutectic Pb-Ag system
Nov.	Thermodynamics-II: Third Law of Thermodynamics, Nernst Heat Theorem, Statement of concept of residual entropy, evaluation absolute entropy from heat capacity data. Gibbs function and Helmholtz Function as thermodynamic quantities. Criteria for thermodynamic equilibrium and spontaneity. Variation of G with P, V and T, Partial molar properties, concept of chemical potential (numerical included) Heterocyclic Compounds Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine 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. .

Name of the Faculty : **Mr. Surender Kumar**
Discipline : **B.SC- III (Phy. Sci.+ Life Sci.) (VOC)**
Semester : **Semester-V**
Subject : **CHEMISTRY**
Lesson Plan duration **From August 2026 to Nov 2026**

Subject/Paper : Sr. No.	Months	Topics to be covered
1	August	Cosmetic definition, history, classification and Ingredients. Unit test.
2	September	Nomenclature and general studies including Preparation of cosmetic. Unit test.
3	October	Uses of cosmetic including hair style like Hair dyes. Assignment.
4	November	Uses of shampoo, conditioners, suntan lotion and hair spray. Revision of syllabus.

Name of the Faculty : **Mr. RAVI KUMAR**
Discipline : **B.SC- I (Physical Science)**
Semester : **Semester-I**
Subject : **CHEMISTRY**
Lesson Plan duration **From August 2026 to Nov 2026**

Week/Month	Name of Topics
August	L. Atomic Structure Dual behaviour of matter and radiation, de Broglie's relation, Heisenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of and 4, shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.
Sept.	Periodic table and atomic properties Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio. II. Gaseous State Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most probable velocity.
Oct.	Collision diameter, collision number. collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Van der Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor) Critical Phenomenon Concept of Critical temperature, critical pressure, critical volume. relationship between critical (Derivation excluded). constants and

	Van der Waal's constants Structure and Bonding Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.
Nov.	Mechanism of Organic Reactions Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reactive intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability).

Name of the Faculty : **Mr. RAVI KUMAR**
Discipline : **B.SC- I (Life Science)**
Semester : **Semester-I**
Subject : **CHEMISTRY**
Lesson Plan duration **From August 2026 to Nov 2026**

Week/Month	Name of Topics
August	L. Atomic Structure Dual behaviour of matter and radiation, de Broglie's relation, Heisenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of n and l, shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules. Periodic table and atomic properties Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.
Sept.	II. Gaseous State Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most probable velocity. Collision diameter, collision number. collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Van der Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor)

	Critical Phenomenon Concept of Critical temperature, critical pressure, critical volume. relationship between critical (Derivation excluded). constants and Van der Waal's constants
Oct.	Structure and Bonding Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison. Mechanism of Organic Reactions Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reactive intermediates: Carbocations, carbanions, free radicals, carbenes (structure & stability).
Nov.	Liquid State Structure of liquids, Properties of liquids - surface tension, refractive index, viscosity, vapour pressure and optical rotation. Solid State Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements, seven crystal systems and fourteen Bravais lattices; X- ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method

Name of the Faculty : **Mr. RAVI KUMAR**
Discipline : **B.A/B.SC- II (MDC)**

Semester : **Semester-III**

Subject : **CHEMISTRY**

Lesson Plan duration **From August 2026 to Nov 2026**

Week/Month	Name of Topics
August	Pollution and their types: Plastic and polyethene pollution, pollution sources, Recycling of plastic, greenhouse effect, ozone depletion
Sept.	Water: Sources of drinking water and uses, water conservation, Permissible TDS, Techniques of purification of water, R.O. water purification process (Osmosis and Reverse Osmosis), wastewater management
Oct.	Energy: Energy sources, renewable and non-renewable sources, cells and batteries, fuel cell, solar cell, polymer cell.
Nov.	Pesticides and Herbicides: General introduction and definition, biological control and chemical control: natural and synthetic pesticides, benefits and adverse effects of DDT, BHC, malathion.