SUS Govt. College Matak Majri, Karnal

Lesson Plan

January 2026 to May 2026

B. Sc. I, Phy. Sci. (Minor Chemistry-II), 2nd Semester

Dr. Gulab Singh

Subject: Minor Chemistry-II (B23-CHE-203)

12 January 2026 to 31 January 2026

Periodic table and atomic properties: Atomic properties: atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, methods of determination or evaluation, trend in periodic table, effective nuclear charge, Slater's rules. Directional characteristics of covalent bond, various type of hybridisation and shapes of simple inorganic molecules and ions (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{-2}, ClO_4^{-1}, NO_3^{-1}

01 February 2026 to 28 February 2026

Ionic Solids: Stoichiometric and Non-stoichiometric defects in crystals, Lattice energy and Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule. Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond (conductors, semiconductors, insulators).

01 March 2026 to 31 March 2026

Metallic Bond and semiconductors: Semiconductors – Introduction, types, and applications. Structure and Bonding in Organic Compounds, Localized and delocalized chemic al bond, Van der Waal's interactions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.

01 April 2026 to 05 May 2026

Stereochemistry of Organic Compounds: Concept of isomerism. Types of isomerism. Optical isomerism, element s of symmetry, enantiomers, stereo genic centre, optical activity, properties of enantiomers, chiral and achiral molecules (upto two stereo genic centres), diastereomers, threo and erythro diastereomers, meso compounds Relative and absolute configuration, sequence rules, R & S systems of nomenclature. Geometrical isomerism. Determination of configuration of geometric isomers.

SUS Govt. College Matak Majri, Karnal

Lesson Plan

January 2026 to May 2026

B. Sc. I, Phy. Sci. & Life Sci., (Chemistry-II, Major), 2nd Semester

Dr. Gulab Singh

Subject: Chemistry-II (B23-CHE-201) Major

12 January 2026 to 31 January 2026

Covalent Bond: Valence bond theory approach, shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Molecular orbital theory of homonuclear (N_2, O_2) and heteronuclear (CO and NO) diatomic molecules, dipole moment and percentage ionic character in covalent bond.

Ionic Solids: Ionic structures (NaCl, CsCl, ZnS (Zinc blende), CaF_2) size effects, radius ratio rule and its limitations, Concept of Lattice energy, Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule.

01 February 2026 to 28 February 2026

Chemical Kinetics: Concept of reaction rates, rate equation, factors influencing the rate of reaction, Order and molecularity of a reaction, integrated rate expression for zero, first, Half-life period of a reaction, Arrhenius equation.

Distribution Law: Nernst distribution law – its thermodynamic derivation, Nernst distribution law after association and dissociation of solute in one of the phases, of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride

01 March 2026 to 31 March 2026

Alkanes and Cycloalkanes: Nomenclature, classification of carbon atoms in alkanes and its structure. Isomerism in alkanes, sources. Methods of formation: Wurtz reaction, Kolbe reaction, Corey- House reaction and decarboxylation of carboxylic acids, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity. Nomenclature of Cycloalkanes, Baeyer' s strain theory and its limitations, theory of strainless r ings.

Alkenes: Nomenclature of alkenes and its structure. Methods of formation: dehydration of alcohols, dehydrohalogenation of alkyl halide, Hofmann elimination and their mechanism. The Saytzeff rule and relative stabilities of alkenes. Chemical reactions: electrophilic and free radical additions, addition of halogens, halogen acids, hydroboration–oxidation, oxymercuration-reduction, ozonolysis and hydration. Markownikoff's rule of addition.

01 April 2026 to 05 May 2026

Hydrogen Bonding and Van der Waals forces: Hydrogen Bonding – Definition, types, effects of hydrogen bonding on properties of substances, application, Brief discussion of various types of Van der Waals forces.

Metallic Bond and semiconductors: Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond (conductors, semiconductors, insulators). Semiconductors – Introduction, types, and applications.

SUS Govt. College Matak Majri, Karnal

Lesson Plan

January 2026 to May 2026

B. Sc. II Phy. Sci. & Life Sci., 4th Semester

Dr. Gulab Singh

Subject: Nursery and Gardening (VOC) (B23-VOC-217)

12 January 2026 to 31 January 2026

Nursery: Definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities–planting, direct seeding and transplants. Seed: Structure and types -Seed dormancy; causes and methods of breaking dormancy, Seed storage: Seed banks, factors affecting seed viability, genetic erosion. Seed production technology: Seed testing and certification.

01 February 2026 to 28 February 2026

Gardening: definition, objectives and scope- different types of gardening-landscape and home gardening-parks and its components-plant materials and design. Gardening operations: Soil laying, manuring, watering, management of pests and diseases and harvesting, sowing/raising of seeds and seedlings, transplanting of seedlings. Computer applications in landscaping.

01 March 2026 to 31 March 2026

Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings. Hardening of plants - greenhouse - mist chamber, shed root, shade house and glass house.

01 April 2026 to 05 May 2026

Cultivation of different vegetables: Cabbage, Brinjal, Lady's finger, Onion, Tomatoes and carrots, Cultivation of different flowers: Marigold, Lilium, Rose, Gerbera, Gladiolus, Chrysanthemum and Carnation. Storage and marketing procedures.

SUS Govt. College Matak Majri, Karnal

Lesson Plan

January 2026 to May 2026

B. Sc. I, Phy. Sci. & Life Sci., BCA-I, 2nd Semester

Dr. Gulab Singh

Subject: Analytical Chemistry (SEC) (B23-SEC-221)

12 January 2026 to 31 January 2026

Chromatography: Definition, general introduction on principles of chromatography, Column chromatography, paper chromatography, TLC&, ion-exchange chromatography.

01 February 2026 to 28 February 2026

Analysis of soil: Composition of soil, Concept of pH and pH measurement, Complexometric titrations, Chelation, Chelating agents, use of indicators.

01 March 2026 to 31 March 2026

Analysis of water: Definition of pure water, sources responsible for contaminating water, water sampling methods, water purification methods.

01 April 2026 to 05 May 2026

Analysis of food products: Nutritional value of foods, idea about food processing and food preservations and adulteration.