



CAMBRIAN PUBLIC SCHOOL KANKE ROAD RANCHI

Class – XI (Session 2026-27)

LEARNING PLAN OUTCOMES

Subject: Chemistry (043)

S. No.	Months	Name of chapter	Learning outcomes
1.	April	Bridge Course Some Basic Concepts of Chemistry	Students will be able to understand the specific topic which play important role in class 11 such as atomic no, valency, oxidation no, atomic radii, ionic radii, periodic table, writing of molecular formula, of alkane, alkene, alkyne (basic), functional group. etc. Students will be able to understand • The contribution of India in the development of chemistry, understand the role of chemistry in different spheres of life; • The characteristics of three states of matter; Different substances into elements, compounds and mixtures; • Scientific notations and determine significant figures; • Differentiate between precision and accuracy; • SI base units and convert physical quantities from one system of units to another; • Various laws of chemical combination; • Significance of atomic mass, average atomic mass, molecular mass and formula mass; • The terms – mole and molar mass; • The mass per cent of component elements constituting compound; • Empirical formula and molecular formula for a compound from the given experimental data; Stoichiometric calculations.
2	May	Structure of Atom	Students will be able to understand • The discovery of electron, proton and neutron and their characteristics; • Thomson, Rutherford and Bohr atomic models; • The important features of the quantum mechanical model of atom; • Nature of electromagnetic radiation and Planck's quantum theory; • The photoelectric effect and describe features of atomic spectra; • The de Broglie relation and Heisenberg uncertainty principle;

			- An atomic orbital in terms of quantum numbers; - Aufbau principle, Pauli exclusion principle and Hund's rule of maximum multiplicity; - The electronic configurations of atoms.
3.	June	Classification of Elements and Periodicity in Properties	Students will be able to understand - The concept of grouping elements in accordance to their properties led to the development of Periodic Table. - The Periodic Law; The significance of atomic number and electronic configuration as the basis for periodic classification; - The elements with $Z > 100$ according to IUPAC nomenclature; - Elements into s, p, d, f blocks and learn their main characteristics; - The periodic trends in physical and chemical properties of elements; - The reactivity of elements and correlate it with their occurrence in nature; - The relationship between ionization enthalpy and metallic character; - Scientific vocabulary appropriately to communicate ideas related to certain important Periodic properties
4.	July	Chemical Bonding and Molecular Structure	Students will be able to understand - Kössel–Lewis approach to chemical bonding; - The octet rule and its limitations, draw Lewis structures of simple molecules; - The formation of different types of bonds; - The VSEPR theory and predict the geometry of simple molecules; - The valence bond approach for the formation of covalent bonds; - The directional properties of covalent bonds; - The different types of hybridization involving s, p and d orbitals and draw shapes of simple covalent molecules; - The molecular orbital theory of homonuclear diatomic molecules; - The concept of hydrogen bond.
5.	August	Thermodynamics	Students will be able to understand - Important terms: system and surroundings; - Discriminate between close, open and isolated systems; - Internal energy, work and heat; First law of thermodynamics and express it mathematically;

			• Energy changes as work and heat • State functions: U, H., Change in internal energy and enthalpy • Standard states for enthalpy changes for various types of reactions; • Hess's law of constant heat summation; extensive intensive properties; spontaneous and Non-spontaneous process; thermodynamic state function and apply it for spontaneity; Gibbs energy change; and Spontaneity
6.	September	Revision and Half Yearly Exam	
7.	October	Equilibrium	Students will be able to understand • Dynamic nature of equilibrium involved in physical and chemical processes; • The law of equilibrium; • Characteristics of equilibria involved in physical and chemical processes; • Expressions for equilibrium constants; • Relationship between K_p and K_c; • Various factors that affect the equilibrium state of a reaction; • Substances as acids or bases according to Arrhenius, Bronsted-Lowry and Lewis concepts; • Acids and bases as weak or strong in terms of their ionization constants; • The dependence of degree of ionization on concentration of the electrolyte and that of the common ion; • pH scale for representing hydrogen ion concentration; • Ionisation of water and its dual role as acid and base; • Ionic product (K_w) and pK_w for water; • Use of buffer solutions; • Solubility product constant.
8.	November	Redox Reaction Organic Chemistry: Some Basic Principles and Techniques	• General Introduction • Oxidation and Reduction: classical concept and electronic concept • Oxidation Number • Balancing of Chemical equation of redox reaction • Redox reaction as the basis for Titration • Redox reaction and electrode process • Reasons for tetravalence of carbon and shapes of organic molecules; • Structures of organic molecules in various ways; The organic compounds;

			• The compounds according to IUPAC system of nomenclature and also derive their structures from the given names; • The concept of organic reaction mechanism; • Influence of electronic displacements on structure and reactivity of organic compounds; • The types of organic reactions; • The techniques of purification of organic compounds; • The chemical reactions involved in the qualitative analysis of organic compounds; • The principles involved in quantitative analysis of organic compounds.
9	December	Hydrocarbon	• Hydrocarbons according to IUPAC system of nomenclature; • Structures of isomers of alkanes, alkenes, alkynes and aromatic hydrocarbons; • Methods of preparation of hydrocarbons; • Distinguish between alkanes, alkenes, alkynes and aromatic hydrocarbons on the basis of physical and chemical properties; • Differentiate between various conformations of ethane; • Appreciate the role of hydrocarbons as sources of energy and for other industrial applications; • The formation of the addition products of unsymmetrical alkenes and alkynes on the basis of electronic mechanism; • The structure of benzene, explain aromaticity and understand mechanism of electrophilic substitution reactions of benzene; • The directive influences of substituents in monosubstituted benzene ring; • Carcinogenicity and toxicity.
11.	January	Revision and Competency Based Questions and Answers	
12.	February and March	Annual Examination	
