Bhartiya Vidya Mandir Sen. Sec. School,Sector 39, Chandigarh Road, Ludhiana

CLASS - XII Subject: Chemistry Session 2024-2025

BOOKS: NCERT

Month	Unit/Chapter/Topic	Learning Objective	Resources/Art-Integrated Pedagogy Tools Used/E-Resources		Learning Outcomes and Skills Learnt by Students
APRIL	Unit I: Basic Concepts of Chemistry: General Introduction : Importance and Scope Nature of matter, laws of chemical combinationDalton's atomic theory: concept of elements, atoms and molecules Atomic and molecular masses, mole concept and molar mass percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry, Concentration terms : Molality, Molarity, mass percent, volume percent and mole fraction .	To understand the the importance of chemistry in daily lifand e Explanation of concept of atoms, elements and molecules and their types Introduction to mole concept and interconversion of mole to number of particles, mass of substance and volume of gas at STP. Introduction to the concepts of empirical and molecular formula and make the learners understand the calculations involved in determining these formulae for a particular compound and Expressing concentration of solution in different term.	lecture method and brain storming questionare. Showing ppt. , By preparing solutions of different concentrations in the lab.	https://diksha.gov.in/play/collection/do_3131034752809205761934?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_312985619117899776151	Learners will be able to appreciate the diverse nature of compounds and the universal laws that are associated with the compound formation .learner will develop analytical thinking, critical thinking and reasoning skill. Learners will be able to know about mole as well as its relation to mass, number of particles and volume of gas at STP.
MAY	**Unit 2: Structure of atom:**Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, dual nature of light, Planck's quantum theory, Black body radiation and photoelectric effect, Bohr's model and its limitations, concept of shells and subshells,dual nature of matter, de Broglie's relationship, Heisenberg uncertainty principle concept of orbitals, quantum numbers, shapes of s, p and d orbitals,Rules for filling electrons in orbitals - Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals	Recalling of different subatomic particles and their discovery. Introduction to the concept of Isotopes and isobars Discussion of historical developments leading to proposal of different models of atom. Intoduction to dual nature of liht and proofs of its particle nature i.e. black body radiation and photoelectric effect. Explanation of concepts and experimental proofs that support de Broglie's hypothesis and Heisenberg's uncertainity principle.	Lecture method	https://diksha.gov.in/play/collection/do_3131034752809205761934?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_31308790314665574412	Learners will be able to understand the significance of balanced chemical equation and its importance in predicting the amount of product formed with given amount of reactants. the learner will develop critical thinking, logical reasoning and creative thinking.

JULY	**Unit 3: Classification of Elements and Periodicity in Properties** ; Ionization enthalpy and electron gain enthalpy , electronegativity, valency. Nomenclature of elements with atomic number greater than 100	Introduction to periodic table, its history and basis for classification in Mendeleev's and modern periodic table, Details of atomic and ionic radii and their variation in period and group, Introduction to ionization enthalpy and electron gain enthalpy and explanation of concepts that cause their variation in periodic manner Describe electronegativity and its effect on valency. Rules for naming elements with atomic number more than 100.	lecture method, explaination of various concepts using Periodic Table. Showing Chart and PPT.	https://diksha.gov.in/play/collection/do_3131034752809205761934?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3130907093605826561465	Learners will be able to understand the need for classification and various developments that lead to the modern periodic table Learners will be able to explain the differences in ionization enthalpy, electronegativity and electron gain enthalpy and howthese properties vary across groupand period. the learner will develop observation skill, critical thinking and analytical thinking.
AUGUST	**UNIT- 4 Chemical Bonding and Molecular structure ;** Valence electrons, ionic bond, covalent bond, bond parameters, VSEPR theory and geometry of covalent molecules, valence bond theory and Concept of hybridization involving s,p and d orbitals and sigma, pi bonds,molecular orbital theory of homonuclear diatomic molecules, Hydrogen bond	Writing Lewis structure for different compounds and explanation of ionic and covalent character in different bond types,Postulates of valence bond theory and description of geometries based on the concept of hybridization of orbitals, Introduction to molecular orbital theory and writing molecular orbital diagrams, Hydrogen bond, its types and its effect on physical properties of compounds	lecture method and brain storming questionare. Showing ppt. , and Charts.	https://diksha.gov.in/play/collection/do_3131034752809205761934?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3130921992839823361956	Learners will be able to draw the structures of different covalent compounds on the basis of VSEPR and explain the structures of different covalent compounds on the basis of hybridization of central atom. Student will develop critical and creative thinking
SEPTEMBER	**UNIT- 7 Redox Reactions; Concept of oxidation and reduction, redox reactions,Oxidation number, Balancing of redox reactions (oxidation number and ion-electron method.**	Explanation on steps involved in balancing redox reactions under different conditions, Explanation of redox reactions in daily life with emphasis on galvanic cell and Electrochemical series	lecture method and brain storming questionare. Showing ppt. , and Charts. Showing working of Electrochemical cell in the lab.	https://diksha.gov.in/play/content/do_312985619312345088154?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content	Learners will be able to calculate oxidation numbers of elements in different compounds and balance redox reactions by either method.

OCTOBER	**UNIT-5 Chemical Thermodynamics;** First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat,measurement of ΔU and ΔH,Hess's law of constant heat summation, enthalpy of combustion and formation, enthalpy of bond dissociation, atomization, sublimation, phase transition, ionization, solution and dilution.Second law of Thermodynamics (brief introduction) Introduction of entropy as a state function	Experimental measurement of enthalpy and internal energy change using calorimetry, Critera of spontaneity of the reaction and its relation to equilibrium	Lecture method and brain storming questionare. Showing ppt. , and Charts	https://diksha.gov.in/play/collection/do_31310347528092057619347referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3131006264192286721676	Learners will be able to calculate various types of enthalpy changes associated with reactions using Hess's law,Learners will be able to know that spontaneity is governed by both entropy and enthalpy.
NOVEMBER	**UNIT- 6 Equilibrium; Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids,acid strength, concept of pH, hydrolysis of salts (elementary idea), buffer solution, Henderson Equation**	ntroduction to concept of electrolytes and its types, along with equilibrium involved in weak electrolytes, Basic concepts of comparing the acidic strength of different acids and numerically calculating the pH, Introduction to hydrolysis of salts and their application as buffers.	Lecture method and brain storming questionare. Showing ppt. , and Charts	https://diksha.gov.in/play/collection/do_31310347528092057619347referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3131077107167678720012548	learners will be able to predict various effects on equilibrium on the basis of Le Chatelier principle ,also Learners will be able to classify strong and weak electrolytes and will be explain equilibrium condition.
DECEMBER	**UNIT- 8 Organic Chemistry; Some basic Principles and Techniques ;** General introduction, classification and IUPAC nomenclature of organic compounds,Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation,Homolytic and heterolytic fission of a covalent bondelectrophiles and nucleophiles, types of organic reactions, methods of purification, qualitative and quantitative analysis	Introduction to Organic compounds and rules for naming them, Explanation of Inductive effect, its types and implications on carbon-carbon bonds. Electromeric effect with its types and implication of organic reactions, Explanation of concept of electrophiles and nucleophiles and hence, classification of ,various organic reactions,Description of various methods and calculations involved in qualitative and quantitative estimation of organic compounds with different functional groups.	Lecture method and brain storming questionare. Showing ppt. , and Charts	https://diksha.gov.in/play/collection/do_31310347528283750411430?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3129856193607843841136	Learners will be able to classify different types of organic compounds and name them,, classify reagents as electrophiles, nucleophiles and various types of chemical reactions, know about various techniques involved in detecting various elements and groups in a compound

JANUARY	UNIT -9 Hydrocarbons; Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties and chemical reactions including halogenation, combustion and pyrolysis, Mechanism of free radical halogenation, Alkenes - Nomenclature, the structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides, Mechanism of electrophilic addition (Markovnikov's addition and peroxide effect), Alkynes - Nomenclature, the structure of triple bond (ethyne)	Introduction of Alkanes and isomerism shown by them. Discussion of conformational isomerism in alkanes, Explanation of various steps of free radical halogenation, Physical properties and addition reactions of alkenes will be discussed	Lecture method and brain storming questionare. Showing ppt. , and Charts. Performing bromine water test in the la to check the unsaturation in the compound.	https://diksha.gov.in/play/collection/do_31310347528283750411430?referrer=utm_source%3Dmobile%26utm_campaign%3Dshare_content&contentId=do_3129856195127214081116	Learners will be able to complete the reactions as well as will be able to give reagents that are required to convert given alkane to its derivative, identify alkenes from formula and write its different geometory, know the reactions of alkenes and will be able to predict the products formed under given set of conditions.