

ANNUAL ACADEMIC PLAN 2023-2024

CHEMISTRY Subject Code:142 FIRST YEAR

Month & No. of working days/ No. of periods	Chapter and Topics to be covered/Assignments/Unit Tests/ Examinations/ EAPCET Classes to be conducted	No. of periods allotted for each topic
June 2023 24	Syllabus dictation and discussion of IPE question paper – weightage of marks to each chapter	(12) 01 01 02 02 02
	1. ATOMIC STRUCTURE	
	1.1 Sub – atomic particles	02
	1.2 Atomic models – Rutherford's nuclear model of atom	
	1.3 Developments leading to the Bohr's model of atom	
	1.4 Bohr's model for hydrogen atom	04
	1.5 Quantum mechanical considerations of sub Atomic particles	
	1.6 Quantum mechanical model of an atom - Important features of the quantum mechanical Model of atom – orbitals and quantum numbers	(10)
	Shapes of atomic orbitals – energies of orbitals -	
	Filling of orbitals in atom: Aufbau Principle, Pauli's exclusion principle and Hund's rule of Maximum multiplicity-electronic configurations	01 01
	Of atoms – stability of completely filled and half Filled sub shells	01
	2. CLASSIFICATION OF ELEMENTS AND PERIODICITY OF PROPERTIES	01
	2.1 Need to classify elements	
	2.2 Genesis of periodic classification	
	2.3 Modern periodic law and the present form of the Periodic table	
	2.4 Nomenclature of elements with atomic number greater than 100	03
	2.5 Electronic configuration of elements and the Periodic table.	01
	PRACTICALS: I. Acquaintance with Laboratory	

	<u>Equipment:</u> 1.Bunsenburner, Spirit Lamp 2.Basic Laboratory equipment (Burette, pipette, conical flask, volumetric flask, measuring, cylinder, wash bottle etc.,) 2.6 Electronic configurations and types of elements: s, p, d, f blocks	01 01
July 2023 24	2.7 Periodic trends in properties of elements -Trends In physical properties –Periodic trends in chemical properties-Periodic trends and chemical reactivity ASSIGNMENTS – 4 (Weekly One) EAPCET Classes – 4 UNIT TEST – 1 (From 26-07-2023 to 28-07-2023) 3. CHEMICAL BONDING AND MOLECULAR STRUCTURE 3.1 Kossel – Lew is approach to chemical bonding 3.2 Ionic or electrovalent bond Bond parameters VSEPR theory: predicting the geometry of simple molecules 3.5 Valence bond theory 3.6 Hybridisation 3.7 Coordinate bond – definition with examples PRACTICALS:II. Basic Laboratory Techniques	03 04 04 (10) 01 01 01 02 01 01 01 04 01
August 2023 25	3.8 Molecular orbital theory –Bonding in some homonuclear di atomic molecules 3.10 Hydrogen bonding 4 . STATES OF MATTER: GASES AND LIQUIDS 4.1 Inter molecular forces 4.2 Thermal energy 4.3 Inter molecular forces Vs thermal interactions 4.4 The gaseous State. 4.5 The gas Laws 4.6 Ideal gas equation. 4.7Graham’s law of diffusion–Dalton’s law of partial pressures	01 01 (10) 01 02

	4.8 Kinetic molecular theory of gases 01 4.9 Kinetic gas equation of an ideal gas (No derivation)–deduction of gas laws from kinetic gas equation 01 4.10 Distribution of molecular speeds – rms, average and most probable speeds –kinetic energy of gas molecules 02 4.11 Behaviour of real gases: deviation from ideal gas behavior – compressible factor Vs pressure diagrams of real gases. 01 4.12 Liquefaction of gases 4.13 Liquid state–properties of liquids in terms of inter molecular interactions – vapour pressure, surface tension and viscosity 01 (Qualitative idea only. No mathematical derivation) ASSIGNMENTS – 4 (Weekly one) UNIT TEST – II From 24-08-2023 to 26-08-2023 EAPCET – 4 Classes (weekly one class)	
September 2023 25	5 STOICHIOMETRY (12) 5.1 Importance of Chemistry –Some basic concepts– 02 5.2 Laws of chemical combinations, Gay Lussac’s law of gaseous volumes, Dalton’s atomic theory, Avogadro’s law 02 5.3 Atomic and molecular masses-mole concept and molar mass concept of equivalent weight 01 5.4 Percentage composition of compounds and Calculations of empirical and molecular formulae of compounds. 5.5 Stoichiometry and stoichiometric calculations QUARTERLY EXAMINATIONS 16-09-2023 TO 23-09-2023 Practicals:III. Purification of Chemical Substances	
	5.6 Methods of expressing concentrations of solutions 01 5.7 Redox reactions 01 5.8 Oxidation number concept 01 5.9 Types of Redox reactions 01 5.10 Balancing of redox reactions –oxidation number method and half reaction (ion-electron) 02 01	

October 2023 18	method 5.11 Redox reactions in Titrimetry 6. THERMO DYNAMICS 6.1. Thermo dynamic terms 6.2 Applications – work – enthalpy – extensive and intensive properties – heat capacity 6.3 Measurement of ΔU and ΔH : Calorimetry 6.4 Enthalpy change, $\Delta_r H$ of a reaction 6.5 Enthalpies for different types of reactions 6.6 Spontaneity 6.7 Gibbs energy change and equilibrium. 6.8 Absolute Entropy and the third law of Thermo dynamics	(07) 01 01 01 01 01 01 01
	7. CHEMICAL EQUILIBRIUM AND ACIDS - BASES 7.1 Equilibrium in physical process. 7.2 Equilibrium in chemical process - dynamic Equilibrium 7.3 Law of chemical equilibrium – law of mass action and equilibrium constant 7.4 Homogeneous equilibria, equilibrium constant in Gaseous systems-relationship between K_p and K_c	(09) 01 01
	7.5 Heterogeneous equilibria 7.6 Applications of equilibrium constants ASSIGNMENTS – 4 (Weekly One) EAPCET Classes – 4 (Weekly One) Practicals:IV. Experiments related to pHchange V. Chemical equilibrium	01 04
	7.7 Relationship between equilibrium constant K , reaction quotient Q and Gibbs energy G 7.8 Factors affecting Equilibria – Le - chatelier's Principle – Application to industrial synthesis of ammonia and Sulphur trioxide 7.9 Ionic equilibrium in solutions 7.10 Acids, bases and salts - Arrhenius, Bronsted – Lowry and Lewis concepts of acids and bases	01 02 02
	7.11 Ionization of acids and bases 7.12 Buffer solutions - designing of buffer solution - preparation of acidic buffer 7.13 Solubility equilibria of sparingly soluble salts solubility product constant, common	01

	ion effect On solubility of ionic salts	(04)
	8. HYDROGEN AND ITS COMPOUNDS 8.1 Position of hydrogen in the periodic table 8.2 Dihydrogen – occurrence and isotopes 8.3 Preparation of dihydrogen 8.4 Properties of dihydrogen 8.5 Hydrides : ionic, covalent and non-stoichiometric Hydrides 8.6 Water: physical properties; structure of water and ice-chemical properties of water; hard and soft water, Temporary and permanent hardness of water 8.7 Hydrogen peroxide: preparation; physical properties; structure and chemical properties; storage and uses Practicals: VI. Quantitative estimation (Volumetric analysis)	01 01 01
	ASSIGNMENTS – 3 (Weekly one) EAPCET – 3 UNIT TEST – 3 From 16-10-2023 to 18-10-2023	
	FIRST TERM HOLIDAYS: FROM 19 -10-2023 TO 25-10-2023	
	8.8 Heavy water 8.9 Hydrogen as a fuel	01
	9. s-BLOCK ELEMENTS: ALKALIAND ALKALINE EARTH METALS GroupI Elements: 9.1 Alkalimetals; electronic configurations; atomic and Ionic radii; ionization enthalpy; hydration enthalpy; physical properties; chemical properties; uses 9.2 General characteristics of the compounds of the alkalimetals : oxides; halides; salts of oxyacids 9.3 Anomalous properties of lithium: 9.4 Some important compounds of sodium: sodium carbonate; sodium chloride; sodium hydroxide; sodium hydrogen carbonate 9.5 Biological importance of sodium and potassium Group2 elements 9.6 Alkaline earth metals; electronic configuration; ionization enthalpy; hydration enthalpy; physical properties; chemical	(06) 01 01 01 01

November 2023 25	properties; uses. 9.7 General characteristics of compounds of the Alkaline earth metals 9.8 Anomalous behavior of beryllium; its diagonal relationship with aluminum 9.9 Some important compounds of calcium 9.10 Biological importance of magnesium and Calcium 10. P-BLOCK ELEMENTS: GROUP-13 BORON FAMILY 10.1 General introduction –electronic configuration, atomic radii, ionization enthalpy, electro negativity; physical and chemical properties 10.2 Important trends and anomalous properties of Boron 10.3 Important compounds of boron – borax, orthoboric acid, diborane 10.4 Uses of boron, aluminium and their compound 11. P-BLOCK ELEMENTS: GROUP – 14 CARBON FAMILY 11.1 General introduction-electronic configuration, atomic and covalent radii, ionization enthalpy, electro negativity; physical and chemical Properties UNIT TEST-4 23-11-2023 to 25-11-2023	01 01 (04) 01 01 01 01 (04) 01 01 01
December 2023 24	Practicals: <u>VII. Qualitative Analysis</u> 1. Reactions of the following anions with at least one confirmatory test for each anion. Carbonate(CO_3^{2-}) Sulphide (S^{2-}), Sulphite(SO_3^{2-}), Sulphate (SO_4^{2-}), Nitrite(NO_2^-), Nitrate(NO_3^-) Chloride(Cl^-) Bromide(Br^-), Iodide(I^-), Phosphate (PO_4^{3-}), Acetate(CH_3COO^-) 11.2 Important trends and anomalous properties of carbon 11.3 Allotropes of carbon 11.4 Uses of carbon 11.5 Some important compounds of carbon and silicon- Carbon monoxide, carbon dioxide, silicon dioxide,	01 02

	Silicone's, silicates and zeolites	
	12. ENVIRONMENTAL CHEMISTRY 12.1 Definition of terms: air, water and soil pollution's 12.2 Environmental pollution 12.3 Atmospheric pollution; 12.4 Acid Rain; particulate pollutants; smog 12.5 Stratospheric pollution 12.6 Water pollution Soil pollution: pesticides and industrial wastes Strategies to control environmental pollution Green chemistry: Green chemistry in day-to-day life	(05) 01 01 01 01 01
	13.ORGANIC CHEMISTRY-SOME BASIC PRINCIPLES AND TECHNIQUES-HYDROCARBONS 13.1 General introduction 13.2 Tetra valency of Carbon: shapes of organic compounds 13.3 Structural representations of organic compounds 13.4 Classification of organic compounds 13.5 Nomenclature of organic compounds 13.6 Isomerism 13.7 Fundamental concepts in organic reaction mechanisms 13.8 Methods of purification of organic compounds 13.9 Qualitative element analysis of organic Compounds 13.10 Quantitative elemental analysis of organic Compounds	(16) 01 01 01 01 01 01 01 01 01
	HALF YEARLY EXAMINATION 18-12-2023 TO 23-12-2023	
	ASSIGNMENTS - 4 (Weekly One) EAPCET Classes - 4 Practicals: VII.2. Reactions of the following cations with at least one confirmatory test for each cation Lead(Pb ²⁺), Copper(Cu ²⁺), Aluminium(Al ³⁺), Ferric(Fe ³⁺), Manganese(Mn ²⁺), Nickel(Ni ²⁺), Zinc(Zn ²⁺), Cobalt(Co ²⁺), Calcium(Ca ²⁺), Strontium(Sr ²⁺), Barium(Ba ²⁺), Magnesium(Mg ²⁺) and Ammonium(NH ₄ ⁺) HYDRO CARBONS 13.11 Classification of hydrocarbons. 13.12 Alkanes-nomenclature, isomerism (structural and conformations of ethane only) Preparation and properties of alkanes 13.13 Alkenes-nomenclature, structure of	04 05 01 01

January 2024 20	ethene, isomerism (structural and geometrical). Methods of preparation of alkenes physical and chemical properties of alkenes 13.14 Alkynes–nomenclature and isomerism, structure of acetylene-methods of preparation of acetylene-physical properties, chemical reactions of acetylene 13.15 Aromatic Hydrocarbons: nomenclature and isomerism-structure of benzene, resonance and aromaticity-Preparation of benzene-physical and chemical properties of benzene-directive influence of functional groups in mono substituted benzene, carcinogenicity and toxicity EAPCET – 4 Classes Assignments – 2 PRE-FINAL EXAMINATIONS 19-01-2024 TO 25-01-2024 PRACTICALS: VIII. Detection of nitrogen, Sulphur and chlorine in an organic compound IX.PROJECT: Scientific investigations involving laboratory testing and collecting information from other sources	01 02 02
February 2024 22	PRACTICAL EXAMS 2nd Week of FEB 2024 TENTATIVE	22
March 2024 23	I.P.E. THEORY EXAMINATIONS 1st WEEK OF MARCH 2024 LAST WORKING DAY: 28.03.2024 Summer vacation : 29-04-2024 to 31-05-2024	22