LESSON PLAN

ACADEMIC SESSION : 2022-24(S)

Discipline : CIVIL ENGG.	Semester : 2ND	Name of the Teaching Faculty : PUSPENDU SAHOO(PTGF CHEMISTRY), DEPT. OF MATH&SCIENCE GP SONEPUR
Subject : Engineering Chemistry	No. of days / week class allotted-04	Semester From date: 29/01/2024 to 14/05/2024 Nos. of Weeks per semester : 15(excluding vacation)
Week	**Class Day**	**Theory**
1ST	1st	Fundamental particles (electron, proton & neutron Definition, mass and charge).
	2nd	Rutherford's Atomic model (postulates and failure)
	3rd	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones.
	4th	Bohr's Atomic model (Postulates only), Bohr-Bury scheme
2ND	1st	Aufbau's principle, Hund's rule, Pauli's exclusion Principle
	2nd	Electronic configuration (up to atomic no. 30).
	3rd	Chemical Bond: Definition and type. Electrovalent Bond: Definition & Examples, formation of NaCl, $MgCl_2$
	4th	Covalent and Coordinate bond: Definiton with examples (formation of H_2,Cl_2, O_2, N_2, H_2O, CH_4, NH_3, NH_4^+, SO_2).
3RD	1st	Concept of Arrhenius and Lowry Bronsted theory for acid and base with examples (Postulates and limitations only).
	2nd	Concept of Lewis theory with examples (Postulates and limitations only). Neutralization of acid & base.
	3rd	Definition of Salt, Types of salts (Normal, acidic, basic, double, complex and mixed salts, Definitions with 2 examples from each).
	4th	Definitions of atomic weight, molecular weight, Equivalent weight. Determination of equivalent weight of Acid, Base and Salt.
4TH	1st	Modes of expression of the concentrations (Molarity , Normality & Molality) with Simple Problems.
	2nd	Modes of expression of the concentrations (Molarity , Normality & Molality) with Simple Problems.
	3rd	pH of solution (definition with simple numericals) Importance of pH in industry (sugar, textile, paper industries only)
	4th	Definition and types (Strong & weak) of Electrolytes with example. Electrolysis (Principle & process) with example of

		NaCl (fused and aqueous solution).
5TH	1st	Faraday's 1st law of Electrolysis (Statement, mathematical expression and Simple numerical)
	2nd	Faraday's 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical)
	3rd	Industrial application of Electrolysis- Electroplating (Zinc only).
	4th	Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion
6TH	1st	Waterline corrosion. Mechanism of rusting of Iron
	2nd	Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	3rd	Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals.
	4th	General methods of extraction of metals:(i) Ore Dressing ii) Concentration : Gravity separation, magnetic separation
7TH	1st	ii) Concentration : Froth floatation & leaching
	2nd	iii) Oxidation : Calcinations
	3rd	iii) Oxidation : Roasting iv) Reduction (Smelting, Definition & examples of flux, slag)
	4th	v) Refining of the metal (Electro refining, & Distillation only)
8TH	1st	**Alloys:** Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example
	2nd	Composition and uses of Brass, Bronze, Alnico, Duralumin
	3rd	**Hydrocarbons :** Saturated and Unsaturated Hydrocarbons (Definition with example)
	4th	Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons
9TH	1st	IUPAC system of nomenclature of Alkane(straight chain)
	2nd	IUPAC system of nomenclature of Alkene, Alkyne (straight chain)
	3rd	IUPAC system of nomenclature alkyl halide and alcohol (straight chain)
	4th	IUPAC system of nomenclature of Alkane, Alkene, Alkyne (Branched chain)
10TH	1st	IUPAC system of nomenclature alkyl halide and alcohol (Branched chain)
	2nd	IUPAC system of nomenclature of Alkane, Alkene, Alkyne, alkyl halide and alcohol (up to 6 carbons) with bond line notation
	3rd	IUPAC Nomenclature: Name to structure conversion
	4th	Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.

11TH	1st	**Water Treatment** : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate)
	2nd	Removal of hardness by cold lime soda method (Principle, process & advantages)
	3rd	Removal of hardness by hot lime soda method (Principle, process & advantages)
	4th	Advantages of Hot lime over cold lime process. Disadvantages of L-S process
12th	1st	Organic Ion exchange method (principle, process, and regeneration of exhausted resins)
	2nd	**Lubricants**: Definition of lubricant, Types (solid, liquid and semisolid with examples only)
	3rd	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication
	4th	**Fuel**: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
13th	1st	Liquid: Diesel, Petrol, and Kerosene --- Composition and uses.
	2nd	Gaseous: Producer gas and Water gas (Composition and uses).
	3rd	Elementary idea about LPG, CNG and coal gas (Composition and uses only).
	4th	**Polymer**: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization.
14th	1st	Difference between Thermosetting and Thermoplastic polymers
	2nd	Composition and uses of Polythene
	3rd	Composition and uses of Polythene, & Poly-Vinyl Chloride and Bakelite.
	4th	Definition of Elastomer (Rubber). Natural Rubber (it's draw backs).
15th	1st	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
	2nd	**Chemicals in Agriculture:** Pesticides: Insecticides(Examples and uses.)
	3rd	**Chemicals in Agriculture:** Pesticides: Herbicides, fungicides- Examples and uses.
	4th	Bio Fertilizers: Definition, examples and uses

Puspendusahoo
PREPARED BY
PUSPENDU SAHOO
Guest faculty (chemistry)

HOD
MATH&SCIENCE

ACADEMIC CO-ORDINATOR
GP SONEPUR