

Lesson Plan: Engineering Chemistry (Th.2b) 1st Sem 2022-23

Discipline: Electrical and ETC (Total Sections: 03)		Semester-1 Winter 2022	Faculty: Dr. Ayusman Swain (Lecturer in Chemistry) Ms. Mamata Das (PTGF, Chemistry)
Sl. No	Subject: Engg. Chemistry	No. Of classes per week in a section:4	Semester From date: 25.10.2022 To date: 31.01.2023 No of weeks: 14
	Week/Month	Class Day	Topic
1	4 th Week/ Oct 2022	1st	Chapter 1: Atomic structure: Fundamental particles (electron, proton & neutron Definition, mass and charge) Rutherford's Atomic model (postulates and failure),
		2nd	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones.
		3rd	Bohr's Atomic model (Postulates only), Bohr-Bury scheme
		4th	Aufbau's principle, Hund's rule, Electronic configuration (up to atomic no 30).
2	1 st Week/ Nov 2022	1st	Chapter 2: Chemical Bonding: Definition, types (Electrovalent, Covalent and Coordinate bond with examples
		2nd	Formation of NaCl, MgCl ₂ , H ₂ , Cl ₂ , O ₂ , N ₂ , Formation of H ₂ O, CH ₄ , NH ₃ , NH ₄ ⁺ , SO ₂
		3rd	Chapter 3: Acid base theory: Concept of Arrhenius, Lowry Bronsted and Lewis theory for acid and base with examples
		4th	Arrhenius, Lowry Bronsted and Lewis theory for acid and base with examples (Postulates and limitations)
3	2 nd Week/ Nov 2022 (Last 3 days)	1st	Neutralization of acid & base. Definition of Salt, Examples. Types of salts (Normal, acidic, basic, double, complex and mixed salts, definitions with examples from each).
		2nd	Chapter 4: Solutions: Definitions of atomic weight, molecular weight, Equivalent weight. Determination of equivalent weight of Acid, Base and Salt.
		3rd	Modes of expression of the concentrations (Molarity, Normality & Molality) with Simple Problems.
		4th	pH of solution (definition with simple numerical) Importance of pH in industry (sugar, textile, paper industries only)
4	3 rd Week/ Nov 2022	1st	Chapter 5: Electrochemistry: Definition and types (Strong & weak) of Electrolytes with example. Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution).
		2nd	Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical).

		3rd	Industrial application of Electrolysis- Electroplating (Zinc only).
		4th	Chapter 6: Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion,
5	4 th Week/ Nov 2022	1st	Waterline corrosion. Mechanism of rusting of Iron. Protection from Corrosion by (i) Alloying and (ii) Galvanization.
		2nd	Chapter 7: Metallurgy: Definition of Mineral, ores, gangue with example.
		3rd	Distinction between Ores and Minerals. General methods of extraction of metals, i) Ore Dressing ii) Concentration (Gravity separation)
		4th	Magnetic separation, Froth floatation & leaching)
6	Last week days Nov 2022	1st	iii) Oxidation (Calcinations, Roasting). iv) Reduction (Smelting, Definition & examples of flux, slag)
		2nd	v) Refining of the metal (Electro refining, & Distillation.
7	1 st Week/ Dec 2022	1st	Chapter 8: Alloys: Definition of alloy. Types of alloys (Ferro, Non-Ferro & Amalgam) with example.
		2nd	Composition and uses of Brass, Bronze, Alnico, Duralumin.
		3rd	Chapter 9 : Hydrocarbons : Saturated and Unsaturated Hydrocarbons (Definition with example)
		4th	Aliphatic and Aromatic Hydrocarbons. Huckle's rule
8	2 nd Week/ Dec 2022	1st	IUPAC system of nomenclature. Alkane, Alkene and Alkyne. Bond line notation.
		2nd	IUPAC system of nomenclature. Alkane. Bond line notation.
		3rd	IUPAC system of nomenclature. Alkene and Alkyne
		4th	IUPAC system of nomenclature of alkyl halide. IUPAC system of nomenclature of alcohol.
9	3 rd Week/ Dec 2022	1st	Uses of some common aromatic compounds. Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid in daily life.
		2nd	Chapter 10: Water Treatment: Sources of water, Soft water, Hard water, hardness
		3rd	types of Hardness (temporary or carbonate and permanent or non-carbonate),
		4th	Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages),
10	4 th Week/ Dec 2022	1st	Advantages of Hot lime over cold lime process.
		2nd	Organic Ion exchange method (principle, process, and regeneration of exhausted resins
		3rd	Chapter 11: Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples)

		4th	Specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication
11	1 st Week/ Jan 2023	1st	Specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication
		2nd	Chapter 12: Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
		3rd	Liquid fuel: Diesel, Petrol, and Kerosene. Gaseous fuel: Producer gas and Water gas (Composition and uses).
		4th	Elementary idea about LPG, CNG and coal gas (Composition and uses)
12	2 nd Week/ Jan 2023	1st	Chapter 13: Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization
		2nd	Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene, Poly-Vinyl Chloride and Bakelite
		3rd	Definition of Elastomer (Rubber). Natural Rubber (it's draw backs). Vulcanization of Rubber. Advantages of Vulcanized rubber over raw rubber.
		4th	Chapter 14: Chemicals in Agriculture: Pesticides: Insecticides, herbicides, fungicides Examples and uses.
13	3 rd Week/ Jan 2023	1st	Bio Fertilizers: Definition, examples and uses.
		2nd	Revision
		3rd	Revision
		4th	Revision
14	4 th Week/ Jan 2023	1st	Revision
		2nd	Revision
		3rd	Revision
		4th	Revision
15	Last week days Jan 2022	1st	Revision
		2nd	Revision