LESSON PLAN

Name of the Faculty: Gayatri Parida
Subject: Engineering Chemistry (Th-2b)
No. of class allotted per week: 04
Lesson plan duration : 15 weeks
Total no. Of classes: 60
Semester: 2nd
Discipline: Civil Engg. & E&Tc Engg.

Week	Lecture Day	Theory
1ST	1ST	Introduction
	2ND	**PHYSICAL CHEMISTRY** CH-1: Fundamental particles(Electron , proton & neutron definition, mass and charge).), Atomic mass, mass number, isotopes, isobar, isotone
	3RD	Rutherford's atomic model (limitations)
	4TH	Bohr's atomic model .
2ND	1ST	Bohr burry scheme. Aufbau principle,
	2ND	Hund's rule, Electronic configuration Ionic bonding, examples
	3RD	CH-2: Chemical Bonding- Definition, types of bonding. Ionic bonding, examples
	4TH	Covalent bonding , Examples
3RD	1ST	Coordinate bonding, examples
	2ND	Ch-3: Acid base theory-Arrhenius concept of acid &base
	3RD	Bronsted-lowry theory of acid and base
	4TH	Lewis concept of acid &base
4TH	1ST	Neutralization of acid & base, salts- definition & types.
	2ND	CH-4 Definition of Atomic weight, molecular weight, equivalent weight,
	3rd	Determination of equivalent weight of salt , acid and, base .

	4TH	Modes of expression of the concentrations (Molarity and normality with simple problem)
5TH	1ST	Molality with Simple Problems.
	2ND	pH of solution (definition with simple numerical). Importance of pH in industry (sugar, textile, paper industries only)
	3RD	Chapter 5 : Electrochemistry : Definition and types (Strong& weak) of Electrolytes with example.
	4TH	Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution
6TH	1ST	Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical)
	2ND	Industrial application of Electrolysis- Electroplating (Zinc only).
	3RD	Chapter 6 : Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion,
	4TH	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization.
7TH	1ST	**INORGANIC CHEMISTRY** Chapter 7 : Metallurgy: Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals.
	2ND	General methods of extraction of metals, i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation, Froth floatation
	3RD	leaching iii) Oxidation (Calcinations, Roasting)
	4TH	iv) Reduction (Smelting, Definition & examples of flux, slag)
8TH	1ST	Refining of the metal (Electro refining, & Distillation only) example.

	2ND	Chapter 8 : Alloys: Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example . Composition and uses of Brass, Bronze, Alnico, Duralumin
	3RD	**ORGANIC CHEMISTRY** Chapter 9 : Introduction to carbon and its valence. 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,
	2ND	IUPAC system of nomenclature of Alkene,
	3RD	IUPAC system of nomenclature of Alkyne,
	4TH	IUPAC system of nomenclature of alkyl halide and alcohol
10TH	1ST	IUPAC system of nomenclature of alkane.alkene,alkyne,alkylhalide and alcohol with bond line notation.
	2ND	Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
	3RD	**INDUSTRIAL CHEMISTRY** Chapter 10 : Water Treatment : Sources of water, Soft water, Hard water, hardness
	4TH	Types of Hardness (temporary or carbonate and permanent or non-carbonate),
11TH	1ST	Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages) , Advantages of Hot lime over cold lime process.
	2ND	Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages) , Advantages of Hot lime over cold lime process.
	3RD	Removal of permanent hardness by Organic Ion exchange method (principle, process, and regeneration of exhausted resins)
	4TH	Removal of permanent hardness by Organic Ion exchange method (principle, process, and regeneration of exhausted resins)

12TH	1ST	Chapter 11 : Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples only) ,purpose of lubrication.
	2ND	specific uses of lubricants (Graphite, Oils, Grease),
	3RD	specific uses of lubricants (Graphite, Oils, Grease),
	4TH	Chapter 12 : Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
13TH	1ST	Liquid fuel : Diesel, Petrol, and Kerosene --- Composition and uses
	2ND	Gaseous fuel: Producer gas and Water gas (Composition and uses).
	3RD	Elementary idea about LPG, CNG and coal gas (Composition and uses only).
	4TH	Chapter 13 : Polymer: Definition of Monomer, Polymer,
14TH	1ST	Definition of Homo-polymer, Co-polymer and Degree of polymerization
	2ND	Difference between Thermosetting and Thermoplastic,
	3RD	Composition and uses of Polythene and of Poly-Vinyl Chloride .
	4TH	Structure and composition and Bakelite
15TH	1ST	Definition of Elastomer (rubber) .Natural rubber (it's drawback)
	2ND	Vulcanization of Rubber. Advantages of Vulcanized rubber over raw rubber
	3RD	Chapter 14: chemicals inAgriculture: Pesticides: Insecticides Herbicides, fungicides- Examples and uses.
	4TH	Bio Fertilizers: Definition, examples and uses.

Learning Resouces:

1. Text Book of Intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma,
2. Engineering Chemistry by Y.R. Sharma and P. Mitra, Kalyani Publishers
3. Engineering Chemistry for Diploma – Dr. R K Mohapatra, PHI Publication, New Delhi.