

LESSON PLAN

SUBJECT: -ENGINEERING CHEMISTRY

SEMESTER: - 2ND SEMESTER SUMMER-20224

ACADEMIC SESSION:-2023-24

SECTION- F (MECHANICAL)

BY

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Discipline: MECHANICAL	Semester: 2 ND	Name of the Teaching Faculty: Dr. Rakesh Ranjan Mahalik
Subject: Engineering Chemistry	No. of Days/week class allotted (Mon, Tue, Wed, Fri)	Semester From: - Date: 01/02/2024 to 14/05/2024 No. of Weeks: - 16
Week	Class Dates	Theory Topics
1 st	02/02/2024	Syllabus Discussion Chapter 1: Atomic structure : Fundamental particles (electron, proton & neutron Definition, mass and charge).
2 nd	05/02/2024 06/02/2024 07/02/2024 09/02/2024	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones. Rutherford's Atomic model (postulates and failure), Bohr's Atomic model (Postulates only), Bohr-Bury scheme, Aufbau's principle, Hund's rule, Electronic configuration (up to atomic no 30)
3 rd	12/02/2024 13/02/2024 16/02/2024	Chapter 2 : Chemical Bonding : Definition , types Electrovalent bond with examples (formation of NaCl, MgCl ₂) Covalent bond with examples (formation of H ₂ , Cl ₂ , O ₂ , N ₂ , H ₂ O, CH ₄ , NH ₃), Formation of covalent bond with examples. Coordinate bond with examples (formation of NH ₄ ⁺ , SO ₂)
4 th	19/02/2024 20/02/2024 21/02/2024 23/02/2024	Chapter 3 : Acid base theory : Concept of Arrhenius, Lowry-Bronsted (Postulates and limitations only). Lewis theory for acid and base with examples (Postulates and limitations only). Neutralization of acid & base. Definition of Salt, Types of salts (Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each. CLASS TEST-1
5 th	26/02/2024 27/02/2024	Chapter 4: Solutions : Definitions of atomic weight, molecular weight, Equivalent weight. Determination of equivalent weight of Acid, Base and Salt. Modes of expression of the concentrations (Molarity,

	28/02/2024	Normality & Molality) with Simple Problems.
6 th	01/03/2024	pH of solution (definition with simple numerical) Importance of pH in industry (sugar, textile, paper industries only)
	04/03/2024	Chapter 5 : Electrochemistry : Definition and types (Strong & weak) of Electrolytes with example. Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution).
	06/03/2024	Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical). Industrial application of Electrolysis- Electroplating (Zinc only)
7 th	11/03/2024	Chapter 6 : Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion,
	12/03/2024	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	13/03/2024	CASSS TEST -2
	15/03/2024	Chapter 7 : Metallurgy: Definition of Mineral, ores, gangue with example. Distinction between Ores And Minerals.
8 th	18/03/2024	General methods of extraction of metals, (i) Ore Dressing, (ii) Concentration (Gravity separation, magnetic separation, Froth floatation & Leaching)
	19/03/2024	(iii) Oxidation (Calcinations, Roasting) (iv) Reduction (Smelting, Definition & examples of flux, slag),
	20/03/2024	(v) Refining of the metal (Electro refining, & Distillation only)
	22/03/2024	Chapter 8: Alloys: Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin
9 th	27/03/2024	Chapter 9 : Hydrocarbons : Saturated and Unsaturated Hydrocarbons (Definition with example) Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons

10 th	02/04/2024 03/04/2024 05/04/2024	IUPAC system of nomenclature of Alkane, Alkene, Alkyne IUPAC system of nomenclature of alkyl halide and alcohol (up to 6 carbons) with bond line notation Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life
11 th	08/04/2024 09/04/2024 10/04/2024 12/04/2024	Previous year semester question discussion (IUPAC Nomenclature) CLASS TEST-3 Chapter 10 : Water Treatment : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate), Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages), Advantages of Hot lime over cold lime process.
12 th	15/04/2024 16/04/2024 19/04/2024	Organic Ion exchange method (principle, process, and regeneration of exhausted resins) Revision and Discussion Chapter 11 : Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples only) and specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication
13 th	22/04/2024 23/04/2024 24/04/2024 26/04/2024	Chapter 12 : Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel. Liquid: Diesel, Petrol, and Kerosene --- Composition and uses. Gaseous: Producer gas and Water gas (Composition and uses). Elementary idea about LPG, CNG and coal gas (Composition and uses only) Revision and Discussion CLASS TEST-4
14 th	29/04/2024 30/04/2024	Chapter 13 : Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization. Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene, Poly-Vinyl Chloride and Bakelite.

	01/05/2024	Definition of Elastomer (Rubber). Natural Rubber & its drawbacks. Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber
	03/05/2024	QUIZ TEST
15 th	06/05/2024	Chapter 14: Chemicals in Agriculture: Pesticides: Insecticides, herbicides, fungicides-Examples and uses. Bio Fertilizers: Definition, examples and uses
	07/05/2024 08/05/2024 10/05/2024	Previous year question and answer discussion. Exam related problem practice Revision
16 th	13/05/2024 14/05/2024	VST FOR SEMESTER EXAM VST FOR SEMESTER EXAM

REFERENCE BOOK:

1. Eng. Chemistry by Y.R. Sharma and P. Mitra, Kalyani Publishers.
2. Textbook of intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma Kalyani Publishers.

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01.02.24

D. P. Sharma
01/02/24
Signature