

## LESSON PLAN : ENGINEERING CHEMISTRY

Discipline: <b>ELECTRICAL ENGINEERING</b>	Semester : <b>1st</b>	Name of the Teaching Faculty: <b>SWATILEENA SATPATHY/ TUSHAR RANJAN MOHANTA</b>
Subject: <b>ENGINEERING CHEMISTRY</b>	No. of days/per week class allotted: <b>04</b>	Semester From date : 16/08/2023 To Date: 11/12/2023  No. of Weeks: 16
<b>Week</b>	<b>Class/ Day</b>	<b>Theory</b>
<b>1<sup>ST</sup></b>	<b>1<sup>ST</sup></b>	Introduction ,Fundamental particles : Electron, Proton & Neutron (mass and charge ) , Rutherford's $\alpha$ - ray Scattering Experiment
	<b>2<sup>ND</sup></b>	Rutherford's Atomic model (Postulates) Failures of Rutherford's Atomic model
<b>2<sup>ND</sup></b>	<b>1<sup>ST</sup></b>	Atomic mass and mass number, Definition, examples and properties of Isotopes, Isobars and Isotones ,Bohr's Atomic model ( Postulates )
	<b>2<sup>ND</sup></b>	Drawbacks of Bohr's Atomic model , Bohr-Bury scheme
	<b>3<sup>RD</sup></b>	Quantum Numbers ,Aufbau's Principle
	<b>4<sup>TH</sup></b>	Pauli's Exclusion Principle, Hund's rule
<b>3<sup>RD</sup></b>	<b>1<sup>ST</sup></b>	Electronic configuration of elements (up to atomic no. 30)
	<b>2<sup>ND</sup></b>	Chemical Bonding: Definition, Types, Electrovalent bond: NaCl , MgCl <sub>2</sub> ,
	<b>3<sup>RD</sup></b>	HOLIDAY
	<b>4<sup>TH</sup></b>	Covalent Bond with examples H <sub>2</sub> ,Cl <sub>2</sub> ,O <sub>2</sub> ,N <sub>2</sub>
<b>4<sup>TH</sup></b>	<b>1<sup>ST</sup></b>	Covalent Bond (contd.) H <sub>2</sub> O, CH <sub>4</sub> , NH <sub>3</sub> ,Coordinate bond : NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub>
	<b>2<sup>ND</sup></b>	Concept of Arrhenius theory of Acids & Bases
	<b>3<sup>RD</sup></b>	HOLIDAY
	<b>4<sup>TH</sup></b>	Bronsted Lowry Theory of Acids & Bases ( Postulates and limitations only).
<b>5<sup>TH</sup></b>	<b>1<sup>ST</sup></b>	Concept of Lewis theory for acid and base with examples (Postulates and limitations only).
	<b>2<sup>ND</sup></b>	Neutralization of acid & base.Types of salts ( Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each).
	<b>3<sup>RD</sup></b>	Definitions of atomic weight, molecular weight,Definition of Equivalent weight
	<b>4<sup>TH</sup></b>	Determination of equivalent weight of Acid, Base ,Salt & Ion.
<b>6<sup>TH</sup></b>	<b>1<sup>ST</sup></b>	Modes of expression of the concentrations ( Molarity , Normality) with Simple Problems
	<b>2<sup>ND</sup></b>	HOLIDAY

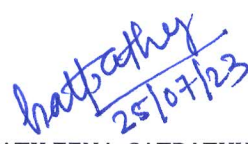
## LESSON PLAN : ENGINEERING CHEMISTRY

6 <sup>TH</sup>	3 <sup>RD</sup>	HOLIDAY
	4 <sup>TH</sup>	Problems on Molarity & Normality(contd.) Modes of expression of the concentrations (Molality)
7 <sup>TH</sup>	1 <sup>ST</sup>	pH of solution ( definition with simple numerical )
	2 <sup>ND</sup>	Importance of pH in industry ( sugar, textile, paper industriesonly),
	3 <sup>RD</sup>	CLASS TEST
	4 <sup>TH</sup>	Definition and types of Electrolytes (Strong & weak) with example.Electrolysis (Principle & process) with example of NaCl (fused).
8 <sup>TH</sup>	1 <sup>ST</sup>	Electrolysis (Principle & process) of aqueous solution of NaCl. Faraday's 1st law of Electrolysis (Statement, mathematical expression).
	2 <sup>ND</sup>	Faraday's 1st law of Electrolysis (numerical) ,Faraday's 2nd law of Electrolysis (Statement, Mathematical expression)Industrial application of Electrolysis- Electroplating ( Zinc only)
	3 <sup>RD</sup>	Corrosion : Defination & Types, Atmospheric Corrosion
	4 <sup>TH</sup>	Waterline corrosion. Mechanism of rusting of Iron only.Protection from Corrosion by (i) Alloying and (ii) Galvanization
9 <sup>TH</sup>	1 <sup>ST</sup>	Definition of Mineral, Ores , Gangue, Flux with example. Distinction between Ores And Minerals, Steps of Metallurgy, Ore Dressing
	2 <sup>ND</sup>	Concentration of Ore :Gravity Separation Method, Froth floatation Method, Leaching
	3 <sup>RD</sup>	Concentration of Ore(contd.): Magnetic separation Method,Oxidation (Calcinations, Roasting ), Reduction (Smelting, Definition & examples of flux, slag)
	4 <sup>TH</sup>	Refining of the metal ( Electro refining & Distillation only) , Definition of alloy.Types of alloys Ferro alloys, Non Ferro alloys &Amalgam with example
10 <sup>TH</sup>	1 <sup>ST</sup>	Composition and uses of Brass, Bronze, Alnico, Duralumin
	2 <sup>ND</sup>	INTERNAL EXAMINATION
	3 <sup>RD</sup>	INTERNAL EXAMINATION
	4 <sup>TH</sup>	Hydrocarbons & Homologous Series, Classification of Hydrocarbons
11 <sup>TH</sup>	1 <sup>ST</sup>	Saturated & Unsaturated hydrocarbons (Definition with example), Aliphatic and Aromatic Hydrocarbons ( Huckle's rule only). Difference between Aliphatic and Aromatic hydrocarbons
	2 <sup>ND</sup>	IUPAC system of nomenclature of Alkane (up to 6 carbons) with bond line notation.
	3 <sup>RD</sup>	IUPAC system of nomenclature of Alkene (up to 6carbons) with bond line notation.
	4 <sup>TH</sup>	IUPAC system of nomenclature of Alkyne (up to 6 carbons) with bond line notation
	1 <sup>ST</sup>	IUPAC system of nomenclature of alkyl halide andalcohol ( up to 6 carbons ) with bond line notation



## LESSON PLAN : ENGINEERING CHEMISTRY

12 <sup>TH</sup>	2 <sup>ND</sup>	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) .
	3 <sup>RD</sup>	Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate)
	4 <sup>TH</sup>	Removal of hardness by lime soda method ( Cold lime soda method--- Principle, process & advantages )
13 <sup>TH</sup>	1 <sup>ST</sup>	Removal of hardness by lime soda method ( Hot lime soda method- Principle, process & advantages ) Advantages & Disadvantages of Lime Soda Method, Advantages of Hot Lime Soda Method over Cold Lime Soda Method
	2 <sup>ND</sup>	Organic Ion exchange method ( principle, process)
	3 <sup>RD</sup>	Regeneration of exhausted resins, Advantage of Ion Exchange Method .
	4 <sup>TH</sup>	CLASS TEST
14 <sup>TH</sup>	1 <sup>ST</sup>	Definition of lubricant, Types ( solid, liquid and semisolid with examples only ) Specific uses of lubricants ( Graphite, Oils, Grease ). Purpose of lubrication
	2 <sup>ND</sup>	Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel .
	3 <sup>RD</sup>	Liquid Fuel: Diesel, Petrol, and Kerosene (Composition and uses)
	4 <sup>TH</sup>	Gaseous Fuel: Producer gas and Water gas (Composition and uses). Elementary idea about LPG, CNG and coal gas (Composition and uses only).
15 <sup>TH</sup>	1 <sup>ST</sup>	Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization
	2 <sup>ND</sup>	Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene, Polyvinyl Chloride.
	3 <sup>RD</sup>	Composition and uses of Bakelite , Definition of Elastomer ( Rubber). Natural Rubber (it's draw backs )
	4 <sup>TH</sup>	Vulcanisation of Rubber. Advantages of Vulcanized rubber over raw rubber
16 <sup>TH</sup>	1 <sup>ST</sup>	Pesticides: Insecticides, herbicides, fungicides Examples and uses .
	2 <sup>ND</sup>	Bio Fertilizers: Definition, examples and uses.
	3 <sup>RD</sup>	DOUBT CLEARING & REVISION
	4 <sup>TH</sup>	REVISION

  
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