LESSON PLAN

ON

ENGINEERING CHEMISTRY

(THEORY)

1ST SEMESTER

SESSION: 2022-23

PREPARED BY

SASWATI MISHRA

PTGF IN CHEMISTRY

GOVERNMENT POLYTECHNIC, PURI

	GOVERNMENT POLYTECHNIC, PURI **DEPARTMENT** **OF** **MATH & SCIENCE**		
Discipline: MECHANICAL	Semester: 1st	Name of the Teaching Faculty: **Miss SASWATI MISHRA,**	
Subject: ENGG. CHEMISTRY	No. of days/ per week class allotted:**04**	Semester From date: 25/10/2022 To Date: 31/01/2023 No. of Weeks: 14	
PRE-REQUISITE	Basic knowledge about general chemistry ,industrial chemistry ,bio-chemical products & their uses .		
COURSE OUTCOMES	**CO1: Understand the basic concept of Chemistry (Atom and Bonding)** **CO2: Understand the concept of Acid base and salt.** **CO3: Apply their knowledge for protection of different metals from corrosion.** **CO4: Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.** **CO5: Understand mechanism of corrosion and preventive methods.**		
Week	**Class Day**	**Theory/Practical Topics**	**DELIVERY METHOD**
1ST	1ST	Introduction	Whiteboard
	2ND	Rutherford's atomic model (limitations), Atomic mass, mass number, isotopes, isobar	Whiteboard
	3RD	Isotones, Bohr's atomic model, Bohr Bury scheme,	Whiteboard
	4TH	Aufbau's principle, Hand's rule, electronic configuration	Whiteboard
2ND	1ST	CH-2: Chemical Bonding- Definition, types of bonding	Whiteboard
	2ND	Ionic bonding, examples, Covalent bonding, Examples, Coordinate bonding, examples	Whiteboard
	3RD	Quiz & Assignment /Doubt Clearing	Whiteboard
	4TH	Ch-3: Acid base theory-Arrhenius concept of acid &base, Bronsted Lowry &Lewis's concept of acid & base	Whiteboard
3RD	1ST	Neutralization of acid & base, salts- definition & types.	Whiteboard
	2ND	Definition of Atomic weight, molecular weight, equivalent weight,	Whiteboard
	3RD	Determination of equivalent weight of Acid, Base	Whiteboard
	4TH	Determination of equivalent weight of salt	Whiteboard
4TH	1ST	Modes of expression of the concentrations (Morality, Normality) with Simple Problems	Whiteboard

	2ND	Molality with Simple Problems	Whiteboard
	3RD	pH of solution (Definition with simple numerical).Importance of pH in industry (sugar, textile, paper industries only)	Whiteboard
	4TH	Chapter 5 : Electrochemistry : Definition and types (Strong & weak) of Electrolytes with example.	Whiteboard
5TH	1ST	Electrolysis (Principle& process) with example of NaCl (fused and aqueous solution).	Whiteboard
	2ND	Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical)	Whiteboard
	3RD	Industrial application of Electrolysis- Electroplating(Zinc only).	Whiteboard
	4TH	Chapter 6 : Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion,	Whiteboard
6TH	1ST	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization.	Whiteboard
	2ND	Chapter 7 : Metallurgy: Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals.	Whiteboard
	3RD	General methods of extraction of metals, i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation, Froth floatation &leaching)	Whiteboard
	4TH	iii) Oxidation (Calcinations, Roasting) iv) Reduction (Smelting, Definition & examples of flux, slag)	Whiteboard
7TH	1ST	v) Refining of the metal (Electro refining, & Distillation only)	Whiteboard
	2ND	Chapter 8 : Alloys: Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin	Whiteboard
	3RD	**Doubt clear**	Whiteboard
	4TH	Chapter 9 : Hydrocarbons : Saturated and Unsaturated Hydrocarbons (Definition with example) Aliphatic and Aromatic Hydrocarbons (Hackle's rule only). Difference between Aliphatic and	Whiteboard

		aromatic hydrocarbons	
8TH	1ST	IUPAC system of nomenclature of Alkane ,	Whiteboard
	2ND	IUPAC system of nomenclature of Alkenes,	Whiteboard
	3RD	IUPAC system of nomenclature of Alkynes,	Whiteboard
	4TH	IUPAC system of nomenclature of alkyl halide and alcohol	Whiteboard
9TH	1ST	Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.	Whiteboard
	2ND	**Doubt clear**	Whiteboard
	3RD	Chapter 10: Water Treatment : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate),	Whiteboard
	4TH	Removal of hardness byline soda method (hot lime & cold lime—Principle, process &advantages) , Advantages of Hot lime over cold lime process.	Whiteboard
10TH	1ST	Organic Ion exchange method (principle, process, and regeneration of exhausted resins)	Whiteboard
	2ND	**Doubt clear**	Whiteboard
	3RD	Chapter 11: Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples only)	Whiteboard
	4TH	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication	Whiteboard
11TH	1ST	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication	Whiteboard
	2ND	**Doubt clear**	Whiteboard
	3RD	Chapter 12: Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.	Whiteboard
	4TH	Liquid: Diesel, Petrol, and Kerosene --- Composition and uses.	Whiteboard
12TH	1ST	Gaseous: Producer gas and Water gas (Composition and uses).	Whiteboard
	2ND	Elementary idea about LPG,CNG and coal gas (Composition and uses only).	Whiteboard
	3RD	**Doubt clear**	Whiteboard

	4TH	Chapter 13 : Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization	Whiteboard
13TH	1ST	Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene	Whiteboard
	2ND	& Poly-Vinyl Chloride and Bakelite.	Whiteboard
	3RD	Definition of Elastomer (Rubber). Natural Rubber (it's draw backs).	Whiteboard
	4TH	Vulcanization of Rubber. Advantages of Vulcanized rubber over raw rubber.	Whiteboard
14TH	1ST	**Doubt clear**	Whiteboard
	2ND	Chapter 14: Chemicals in Agriculture: Pesticides: Insecticides,	Whiteboard
	3RD	herbicides, fungicides-Examples and uses.	Whiteboard
	4TH	Bio Fertilizers: Definition, examples and uses.	Whiteboard

Learning Resources:

1. Textbook 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.

26/10/22 (P.P. Rout)

Signature of concerned lecturer **Signature of the H.O.D** **Signature of Principal**

Saraswati Mishra
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