GOVERNMENT POLYTECHNIC, PURI
DEPARTMENT OF MATHS &SCIENCE

Discipline: **MECHANICAL ENGG**	Semester: **1ST**	Name of the Teaching Faculty: **MRS. SUBHASHREE PRIYADARSHINI, LECTURER IN CHEMISTRY**
Subject: ENGG. CHEMISTRY	No. of days/per week class allotted: **04**	Semester From date: 25·10·2021 To Date: 31·01·2022 No. of Weeks: **15**
PRE-REQUISITE	Basic knowledge about general chemistry, industrial chemistry, bio chemical products and their uses.	
COURSE OUTCOMES	**CO1:** Understand the basic concepts of chemistry (atom, bonding) **CO2:** Understand the concepts of acid, base & 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,	PPT
	4TH	Aufbau's principle, Hund's rule, electronic configuration	PPT
2ND	1ST	CH-2: Chemical Bonding- Definition, types of bonding, Ionic bonding, examples	Whiteboard
	2ND	Covalent bonding, Examples	Whiteboard
	3RD	Coordinate bonding, examples	PPT
	4TH	**QUIZ & ASSIGNMENT/ DOUBT CLEARING**	
3RD	1ST	Ch-3: Acid base theory-Arrhenius concept of acid & base	Whiteboard
	2ND	Bronsted Lowry & Lewis's concept of acid & base	Whiteboard
	3RD	Neutralization of acid & base, salts- definition & types.	Whiteboard
	4TH	Definition of Atomic weight, molecular weight, equivalent weight,	Whiteboard
4TH	1ST	Determination of equivalent weight of Acid, Base & salt	Whiteboard
	2ND	Modes of expression of the concentrations (Molarity, Normality) with Simple Problems	Whiteboard
	3RD	Molality with Simple Problems	Whiteboard
	4TH	pH of solution (definition with simple numerical), Importance of pH in industry (sugar, textile, paper industries only)	Whiteboard
5TH	1ST	Chapter 5: Electrochemistry: Definition and types (Strong & weak) of Electrolytes with example	Whiteboard
	2ND	Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution).	Whiteboard
	3RD	. Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical)	PPT
	4TH	Industrial application of Electrolysis- Electroplating (Zinc only).	Whiteboard

6TH	1ST	Chapter 6: Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion,	Whiteboard
	2ND	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization.	Whiteboard
	3RD	**QUIZ & ASSIGNMENT**	Whiteboard
	4TH	**DOUBT CLEARING**	Lecture notes
7TH	1ST	Chapter 7: Metallurgy: Definition of Mineral, ores, gangue with example. Distinction between Ores And Minerals.	PPT
	2ND	General methods of extraction of metals, i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation, Froth floatation & leaching)	PPT
	3RD	iii) Oxidation (Calcinations, Roasting) iv) Reduction (Smelting, Definition & examples of flux, slag)	Whiteboard
	4TH	v) Refining of the metal (Electrorefining, & Distillation only)	Whiteboard
8TH	1ST	Chapter 8: Alloys: Definition of alloy. Types of alloys (Ferro, Non-Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin	Whiteboard
	2ND	**QUIZ & ASSIGNMENT**	PPT
	3RD	Chapter 9: Hydrocarbons: Saturated and Unsaturated Hydrocarbons (Definition with example) Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons	Whiteboard
	4TH	IUPAC system of nomenclature of Alkane,	Whiteboard
9TH	1ST	IUPAC system of nomenclature of Alkene,	Whiteboard
	2ND	IUPAC system of nomenclature of Alkyne,	Whiteboard
	3RD	IUPAC system of nomenclature of alkyl halide and alcohol	Whiteboard
	4TH	Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.	Lecture notes
10TH	1ST	**QUIZ & ASSIGNMENT**	PPT
	2ND	Chapter 10: Water Treatment: Sources of water, soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate),	PPT
	3RD	Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages), Advantages of Hot lime over cold lime process.	PPT
	4TH	Organic Ion exchange method (principle, process, and regeneration of exhausted resins)	PPT
11TH	1ST	Doubt clear	PPT
	2ND	Chapter 11: Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples only)	Whiteboard
	3RD	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication	Lecture notes
	4TH	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication	Whiteboard

12TH	1ST	specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication	PPT
	2ND	**QUIZ & ASSIGNMENT**	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
13TH	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	Chapter 13: Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization	Whiteboard
	4TH	Difference between Thermosetting and Thermoplastic, Poly-Vinyl Chloride	Lecture notes
14TH	1ST	Bakelite, Definition of Elastomer (Rubber). Natural Rubber (it's draw backs), Vulcanisation of Rubber. Advantages of Vulcanized rubber over raw rubber.	Whiteboard
	2ND	Chapter 14: Chemicals in Agriculture: Pesticides: Insecticides	Whiteboard
	3RD	herbicides, fungicides-Examples and uses. Bio Fertilizers: Definition, examples and uses	Whiteboard
	4TH	REVISION	PPT
15TH	1ST	REVISION	PPT
	2ND	REVISION	PPT
	3RD	REVISION	PPT
	4TH	REVISION	PPT

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.

25.10.21

Sign. of Faculty concerned

25/10/21

Sign. of HOD i/c

Principal
G.P Puri