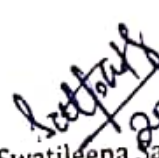


**LESSON PLAN: ENGINEERING CHEMISTRY**

Discipline: MECHANICAL ENGG.	Semester: 2 <sup>nd</sup>	Name of the Teaching Faculty: SWATILEENA SATPATHY
Subject: ENGINEERING CHEMISTRY	No. of days/per week class allotted: 02	Semester From date : 20/03/2023 To date: 27/06/2023  No. of Weeks: 15
Week	Class Day	Theory
1 <sup>st</sup>	1 <sup>st</sup>	Chemical Bonding: Definition, Types, Electrovalent bond: NaCl, MgCl <sub>2</sub>
	2 <sup>nd</sup>	Covalent Bond with examples H <sub>2</sub> , Cl <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> O, CH <sub>4</sub> , NH <sub>3</sub>
2 <sup>nd</sup>	1 <sup>st</sup>	Coordinate bond : NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub>
	2 <sup>nd</sup>	Definitions of atomic weight, molecular weight, Equivalent weight
3 <sup>rd</sup>	1 <sup>st</sup>	Determination of equivalent weight of Acid, Base and Salt.
	2 <sup>nd</sup>	Modes of expression of the concentrations (Molarity) With Simple Problems
4 <sup>th</sup>	1 <sup>st</sup>	Modes of expression of the concentrations (Normality & Molality) With Simple Problems
	2 <sup>nd</sup>	pH of solution (definition with simple numerical)
5 <sup>th</sup>	1 <sup>st</sup>	Importance of pH in industry (sugar, textile, paper industries only)
	2 <sup>nd</sup>	Definition of Mineral, ores, gangue with example. Distinction between Ores And Minerals
6 <sup>th</sup>	1 <sup>st</sup>	Steps of Metallurgy : Ore Dressing, Concentration of Ore (Gravity Separation, magnetic separation)
	2 <sup>nd</sup>	Concentration of Ore (Froth floatation & leaching)
7 <sup>th</sup>	1 <sup>st</sup>	Oxidation (Calcinations, Roasting)
	2 <sup>nd</sup>	Reduction (Smelting, Definition & examples of flux, slag)
8 <sup>th</sup>	1 <sup>st</sup>	Refining of the metal ( Electro refining, & Distillation only)
	2 <sup>nd</sup>	Definition of alloy. Types of alloys ( Ferro, Non Ferro & Amalgam) with example
9 <sup>th</sup>	1 <sup>st</sup>	Composition and uses of Brass, Bronze, Alnico, Duralumin
	2 <sup>nd</sup>	Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate)
10 <sup>th</sup>	1 <sup>st</sup>	Removal of hardness by lime soda method ( hot lime—Principle, process & advantages )
	2 <sup>nd</sup>	Removal of hardness by lime soda method ( Cold lime— Principle, process & advantages )
11 <sup>th</sup>	1 <sup>st</sup>	Advantages of Hot lime over cold lime process.
	2 <sup>nd</sup>	Organic Ion exchange method ( principle, process, and regeneration of exhausted resins)

12 <sup>th</sup>	1 <sup>st</sup>	Definition of lubricant, Types (solid, liquid and semi solid with examples only)
	2 <sup>nd</sup>	Specific uses of Lubricants (Graphite, Oils, Grease), Purpose of lubrication.
13 <sup>th</sup>	1 <sup>st</sup>	Definition and classification of fuel.
	2 <sup>nd</sup>	Definition of calorific value of fuel, Choice of good fuel.
14 <sup>th</sup>	1 <sup>st</sup>	Liquid: Diesel, Petrol and Kerosene- Composition and uses.
	2 <sup>nd</sup>	Gaseous: Producer gas and Water gas ( Composition and uses)
15 <sup>th</sup>	1 <sup>st</sup>	Elementary idea about LPG, CNG and Coal gas (Composition and uses only)
	2 <sup>nd</sup>	Bio Fertilizers: Definition, examples and uses.

  
 Swatileena Satpathy  
 Lect. In Chemistry  
 Govt. Polytechnic Angul

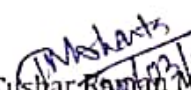
# LESSON PLAN: ENGINEERING CHEMISTRY

Discipline: MECHANICAL ENGG.	Semester: 2 <sup>nd</sup>	Name of the Teaching Faculty: TUSHAR RANJAN MOHANTA
Subject: ENGINEERING CHEMISTRY	No. of days/Per Week class allotted: 02	Semester From date : 20/03/2023 To date: 27/06/2023  No. of Weeks: 15
Week	Class Day	Theory
1 <sup>st</sup>	1 <sup>st</sup>	Introduction, Fundamental particles : Electron, Proton & Neutron (mass and charge)
	2 <sup>nd</sup>	Rutherford's Atomic model (Experiment, postulates), Failures of Rutherford's Atomic model
2 <sup>nd</sup>	1 <sup>st</sup>	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones, Bohr's atomic model (Postulates only)
	2 <sup>nd</sup>	Bohr-Bury scheme, Aufbau's principle
3 <sup>rd</sup>	1 <sup>st</sup>	Hund's rule, Electronic configuration (upto atomic no. 30)
	2 <sup>nd</sup>	Concept of Arrhenius, Bronsted Lowry Theory with examples (Postulates and limitations only).
4 <sup>th</sup>	1 <sup>st</sup>	Lewis theory for acid and base with examples (Postulates and limitations only). Neutralization of acid & base.
	2 <sup>nd</sup>	Types of salts (Normal, acidic, basic, double, complex and mixed Salts, definitions with 2 examples from each).
5 <sup>th</sup>	1 <sup>st</sup>	Definition and types ( Strong & weak) of Electrolytes with example. Electrolysis ( Principle & process) with example of NaCl (fused and aqueous solution).
	2 <sup>nd</sup>	Faraday's 1st law of Electrolysis (Statement, mathematical expression, numerical)
6 <sup>th</sup>	1 <sup>st</sup>	Faraday's 2nd law of Electrolysis (Statement, Mathematical expression, numerical), Industrial application of Electrolysis-Electroplating (Zinc only)
	2 <sup>nd</sup>	Corrosion : Definition & Types, Atmospheric Corrosion
7 <sup>th</sup>	1 <sup>st</sup>	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization
	2 <sup>nd</sup>	Saturated and Unsaturated Hydrocarbons ( Definition with example)
8 <sup>th</sup>	1 <sup>st</sup>	Aliphatic and Aromatic Hydrocarbons ( Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons
	2 <sup>nd</sup>	IUPAC system of nomenclature of Alkane
9 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkane-examples
	2 <sup>nd</sup>	IUPAC system of nomenclature of Alkene
10 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkene-examples
	2 <sup>nd</sup>	IUPAC system of nomenclature of Alkyne
11 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkyne-examples
	2 <sup>nd</sup>	IUPAC system of nomenclature of alkyl halide and alcohol

## LESSON PLAN : ENGINEERING CHEMISTRY

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	2 <sup>nd</sup>	Rutherford's Atomic model ( Experiment, postulates), Failures of Rutherford's Atomic model
2 <sup>nd</sup>	1 <sup>st</sup>	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones, Bohr's atomic model (Postulates only)
	2 <sup>nd</sup>	Bohr-Bury scheme, Aufbau's principle
3 <sup>rd</sup>	1 <sup>st</sup>	Hund's rule, Electronic configuration (upto atomic no. 30)
	2 <sup>nd</sup>	Concept of Arrhenius, Bronsted Lowry Theory with examples (Postulates and limitations only).
4 <sup>th</sup>	1 <sup>st</sup>	Lewis theory for acid and base with examples (Postulates and limitations only). Neutralization of acid & base.
	2 <sup>nd</sup>	Types of salts (Normal, acidic, basic, double, complex and mixed Salts, definitions with 2 examples from each).
5 <sup>th</sup>	1 <sup>st</sup>	Definition and types ( Strong & weak) of Electrolytes with example. Electrolysis ( Principle & process) with example of NaCl (fused and aqueous solution).
	2 <sup>nd</sup>	Faraday's 1st law of Electrolysis (Statement, mathematical expression, numerical)
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	2 <sup>nd</sup>	Corrosion : Definition & Types, Atmospheric Corrosion
7 <sup>th</sup>	1 <sup>st</sup>	Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization
	2 <sup>nd</sup>	Saturated and Unsaturated Hydrocarbons ( Definition with example)
8 <sup>th</sup>	1 <sup>st</sup>	Aliphatic and Aromatic Hydrocarbons ( Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons
	2 <sup>nd</sup>	IUPAC system of nomenclature of Alkane
9 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkane-examples
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	2 <sup>nd</sup>	IUPAC system of nomenclature of Alkyne
11 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkyne-examples
	2 <sup>nd</sup>	IUPAC system of nomenclature of alkyl halide and alcohol

12 <sup>th</sup>	1 <sup>st</sup>	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
	2 <sup>nd</sup>	Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization.
13 <sup>th</sup>	1 <sup>st</sup>	Difference between Thermosetting and Thermoplastic
	2 <sup>nd</sup>	Composition and uses of Polythene, & Poly-Vinyl Chloride
14 <sup>th</sup>	1 <sup>st</sup>	Composition and uses of Bakelite
	2 <sup>nd</sup>	Definition of Elastomer ( Rubber). Natural Rubber (it's draw backs )
15 <sup>th</sup>	1 <sup>st</sup>	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
	2 <sup>nd</sup>	Pesticides: Insecticides, herbicides, fungicides-Examples and uses

  
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