

LESSON PLAN
SUBJECT- APPLIED CHEMISTRY

Discipline : Electrical/Mechatronics Engg.		Semester: 2nd Sem	Name of the Teaching Faculty :Prasant Behera
Subject : TH.2b		No. of Days / per week class allotted	Semester From date : 04.02.2025 To Date : 17.05.2025
Month	Week	Day	Topics
FEBRUARY	2nd	3rd	Unit 1: Atomic Structure, Chemical Bonding and Solutions: Rutherford model of atom, Bohr's theory (expression of energy and radius to be omitted), and hydrogen spectrum explanation based on Bohr's model of atom.
		5th	Heisenberg uncertainty principle, Quantum numbers – orbital concept. Shapes of s,p and d orbitals,
	3rd	3rd	Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.
		5th	Concept of chemical bonding – cause of chemical bonding, types of bonds:
	4th	3rd	ionic bonding (NaCl example), covalent bond (H ₂ , F ₂ , HF hybridization in BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O)
		5th	coordination bond in NH ₄ ⁺ , and anomalous properties of NH ₃ , H ₂ O due to hydrogen bonding, and metallic bonding.
	5th	5th	Solution – idea of solute, solvent and solution, methods to express the concentration of solution
MARCH	2nd	5th	molarity (M = mole per liter), ppm, mass percentage, volume percentage and mole fraction.
	3rd	1st	Numericals
	4th	3rd	Unit 5: Electro Chemistry: Electronic concept of oxidation, reduction and redox reactions.
		5th	Definition of terms: electrolytes, non-electrolytes with suitable examples,
	5th	3rd	Faradays laws of electrolysis and simple numerical problems.
5th		Industrial Application of Electrolysis – • Electrometallurgy • Electroplating • Electrolytic refining	
APRIL	1st	3rd	Application of redox reactions in electrochemical cells – • Primary cells – dry cell,
		5th	Secondary cell - commercially used lead storage battery, fuel and
	2nd	3rd	Solar cells. Introduction to Corrosion of metals – • definition, types of corrosion (chemical and electrochemical),
		5th	H ₂ liberation and O ₂ absorption mechanism of electrochemical corrosion, factors affecting rate of corrosion.

	3rd	3rd	Internal corrosion preventive measures – • Purification, alloying
	4th	3rd	d heat treatment and External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.
		5th	Natural occurrence of metals – minerals, ores of iron, aluminium and copper
	5th	3rd	, gangue (matrix), flux, slag, metallurgy – brief account of general principles of metallurgy
MAY	1st	5th	
	2nd	3rd	Extraction of - iron from haematite ore using blast furnace
		5th	aluminium from bauxite along with reactions. Alloys definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples, properties and applications
	3rd	3rd	General chemical composition, compositionbasedapplications (elementary idea only details omitted):
		5th	Port land cement and hardening, Glasses Refractory and Composite materials.