



GOVERNMENT POLYTECHNIC DARLIPALI, SUNDARGARH

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ ଦଲିପାଲି, ସୁନ୍ଦରଗଡ଼

GOVERNMENT OF ODISHA | ଓଡ଼ିଶା ସରକାର

A/ P: Darlipali , NTPC Darlipali ,Dist.: Sundargarh, Odisha- 758001

Website: <https://gpdarlipali.org.in/> in E-mail: gpdarlipali24@gmail.com

DEPARTMENT OF HUMANITIES & SCIENCES

LESSON PLAN (ACADEMIC SESSION 25-26)

Discipline: Chemistry	Semester: 2nd	Branch: All	Name of the teaching faculty: Dr. Prabhanjan Pradhan
Subject: Applied Chemistry	No of Days/Week class allotted: 4	Semester from Date: 09/01/2026 to 08/05/2026 No of weeks: 19 No. of Period Available: 61	
Month	Week	No of periods available	Class Day Theory topics to be covered
JANUARY	1st	1P	Unit 1: Atomic Structure, Chemical Bonding and Solutions: Rutherford model of atom,
			Bohr's theory (expression of energy and radius to be omitted),
	2nd	3P	hydrogen spectrum explanation based on Bohr's model of atom.
			Heisenberg uncertainty principle, Quantum numbers – orbital concept.
			Shapes of s,p and d orbitals,
			Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.
	3rd	3P	Concept of chemical bonding – cause of chemical bonding, types of bonds:
			ionic bonding (NaCl example),
			covalent bond (H ₂ , F ₂ , HF hybridization in BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O)
	4th	3P	coordination bond in NH ₄ ⁺ , and anomalous properties of NH ₃ , H ₂ O due to hydrogen bonding, and metallic bonding.
			Solution – idea of solute, solvent and solution, methods to express the concentration of solution
			molarity (M = mole per liter), ppm, mass percentage, volume percentage and mole fraction.
	5th	4P	Numericals
			Revision of important topics and previous year question paper discussion
			Revision of important topics and previous year question paper discussion
			Class Test
	6th	4P	Unit 2: Water Graphical presentation of water distribution on Earth (pie or bar diagram). Classification of soft and hard water based on soap test,
			salts causing water hardness, unit of hardness and simple numerical on water hardness.
			Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc),



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FEBRUARY			quantitative measurement of water hardness by ETDA method, total dissolved solids (TDS) alkalinity estimation.
	7th	4P	I) Water softening techniques – soda lime process, zeolite process and ion exchange process. II) Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.
			Water for human consumption for drinking and cooking purposes from any water sources
			enlist Indian standard specification of drinking water (collect data and understand standards).
			Revision of important topics and previous year question paper discussion
	8th	4P	Revision of important topics and previous year question paper discussion
			Class Test
			Unit 3: Engineering Materials Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag, metallurgy – brief account of general principles of metallurgy.
			Extraction of - iron from haematite ore using blast furnace, aluminium from bauxite along with reactions. Alloys – definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples, properties and applications.
	9th	3P	General chemical composition, composition based applications (elementary idea only details omitted): Portland cement and hardening, Glasses Refractory and Composite materials.
			Polymers – monomer, homo and co polymers, degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE, nylon – 6, nylon-6,6 and Bakelite), rubber and vulcanization of rubber.
			Revision of important topics and previous year question paper discussion



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MARCH	10th	4P	Revision of important topics and previous year question paper discussion
			Class Test
			Unit 4: Chemistry of Fuels and Lubricants Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula.
	11th	4P	Proximate analysis of coal solid fuel
			petrol and diesel - fuel rating (octane and cetane numbers)
			Chemical composition, calorific values
			applications of LPG, CNG, water gas, coal gas, producer gas and biogas.
	12th	4P	Lubrication – function and characteristic properties of good lubricant, classification with examples,
			lubrication mechanism – hydrodynamic and boundary lubrication,
			physical proper- ties (viscosity and viscosity index, oiliness, flash and fire point, could and pour point only)
			chemical properties (coke number, total acid number saponification value) of lubricants.
	13TH	2P	Revision of important topics and previous year question paper discussion
			Class Test
	14th	1P	Class Test
			Unit 5: Electro Chemistry: Electronic concept of oxidation, reduction and redox reactions.
	15th	3P	Definition of terms: electrolytes, non-electrolytes with suitable examples,
			Faradays laws of electrolysis and simple numerical problems.
			Industrial Application of Electrolysis – • Electrometallurgy • Electroplating • Electrolytic refining
			Application of redox reactions in electrochemical cells – • Primary cells – dry cell,
			Secondary cell - commercially used lead storage battery, fuel and



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APRIL	16th	4P	Solar cells. Introduction to Corrosion of metals – • definition, types of corrosion (chemical and electrochemical),
			H ₂ liberation and O ₂ absorption mechanism of electrochemical corrosion, factors affecting rate of corrosion.
	17th	4P	Internal corrosion preventive measures – • Purification, alloying
			d heat treatment and External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.
			Natural occurrence of metals – minerals, ores of iron, aluminium and copper
			, gangue (matrix), flux, slag, metallurgy – brief account of general principles of metallurgy
	18th	4P	Extraction of - iron from haematite ore using blast furnace
			aluminium from bauxite along with reactions. Alloys
			definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples, properties and applications
			General chemical composition, composition based applications (elementary idea only details omitted):
MAY	19th	4P	Port land cement and hardening
			Glasses Refractory and Composite materials.
			Revision of important topics and previous year question paper discussion
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Prabh
06/01/2026.

Dr. Prabhanjan Pradhan
Lect. St. I (Chemistry)