BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, KATAKA

DEPARTMENT: HUMANITIES AND SCIENCES

LESSON PLAN

SUBJECT: - APPLIED CHEMISTRY (THEORY)

ACADEMIC SESSION:-2026-27

YEAR: - 1ST

SECTION: - G 1 BRANCH:- ELECTRICAL

Prepared by

Ms Supritika Sundi

Lect. (S-II) in Chemistry

Lesson Plan
Subject: Applied Chemistry & Enviromental Science(TH-3)

ne : Electrical, Sec: (G1) 1st	Name of Faculty : Ms Supritika Sundi
f period per week allotted: Total Period:128 on,Wed(2),Fri]	Session From Date: 17-08-2026 to 17-04-2027

Week	Class Day	Theory Topics
1st	1	**Unit– 1 Air and, Noise Pollution** Definition of pollution and pollutant, classification of pollutant(primary andsecondary)
	2	Natural and man made sources of air pollution
	3	Air Pollutants: Types, Particulate Pollutants: Classification & Effects
	4	Control of Particulate Pollutants(Bag filter, Cyclone separator,)
2nd	5	Electrostatic Precipitator
	6	Gaseous Pollution Control : Catalytic Converter
	7	Effects of air pollution due to Refrigerants, I.C., Boiler
	8	Noise pollution: Definition & sources of pollution
3rd	9	Effects of Noise pollution
	10	Control of Noise pollution
	11	**Unit- 2 Water and Soil Pollution** Sources of water pollution, Types of water pollutants
	12	Characteristics of water pollutants Turbidity, pH, total suspended solids
4th	13	total solids BOD and COD
	14	Waste Water Treatment: Primary methods: sedimentation, froth floatation
	15	Secondary methods: Activated sludge treatment, Bioreactor
	16	Tertiary Method: Membrane separation technology, RO (reverse osmosis).
5th	17	Soil Pollution: Definition & Causes
	18	Effects and Preventive measures of Soil Pollution
	19	Effects of Excessive use of Fertilizers on Soil Pollution
	20	Effects of Excessive use of Pesticides and Insecticides on Soil Pollution
6th	21	Effects of excessive Irrigation on Soil Pollution
	22	Effects of E-waste on Soil Pollution
	23	**Unit-3 Solid Waste Management** Solid waste generation- Sources and characteristics of : Municipal solid waste,
	24	Sources and characteristics of E- waste, bio- medical waste
7th	25	Sources and characteristics of Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.
	26	Collection and disposal: MSW
	27	3R principles, energy recovery,
	28	sanitary landfill, Hazardous waste.
8th	29	Concept of Carbon Credit
	30	Concept of Carbon Footprint.
	31	Environmental management in fabrication industry
	32	**Class Test**

Week	Class Day	Theory Topics
9th	33	**Unit-4 Electrochemistry & Corossion** Electronic concept of oxidation, reduction and redox reactions
	34	Definition of terms: electrolytes, non-electrolytes with suitable examples
	35	Faradays 1st law of electrolysis and simple numerical problems
	36	Faradays 2nd law of electrolysis and simple numerical problems
10th	37	Industrial Application of Electrolysis –Electrometallurgy, Electroplating
	38	Industrial Application of Electrolysis Electrolytic refining
	39	Application of redox reactions in electrochemical cells – Primary cells – dry cell
	40	Secondary cell - commercially used lead storage battery
11th	41	Application of redox reactions in electrochemical cells - fuel cells.
	42	Introduction to Corrosion of metals - definition, types of corrosion (chemical and electrochemical)
	43	H2 liberation and O2 absorption mechanism of electrochemical corrosion
	44	factors affecting rate of corrosion.
12th	45	Internal corrosion preventive measures –Purification, alloying and heat treatment
	46	External corrosion preventive measures: a) metal (anodic, cathodic) coatings
	47	External corrosion preventive measures: b) organic inhibitors.
13th	48	**Unit-5 Chemistry of Fuels and Lubricants** Definition of fuel, classification of fuels,
	49	calorific values (HCV and LCV)
	50	Liquid fuels petrol fuel rating octane number
	51	Liquid fuels diesel fuel rating cetane numbers
14th	52	Chemical composition, calorific values and applications of LPG, CNG,
	53	Chemical composition, calorific values and applications water gas, coal gas, producer gas and biogas.
	54	Lubricant – Definition, function, classification with examples
	55	Lubrication definition and mechanism hydrodynamic and boundary lubrication
15th	56	Lubrication definition and mechanism boundary lubrication
	57	Physical properties (viscosity and viscosity index, oiliness,
	58	Physical properties flash and fire point, cloud and pour point only)
	59	chemical properties - coke number, total acid number of lubricants
16th	60	chemical properties - saponification value of lubricants,
	61	characteristic properties of good lubricant
	62	**Class Test**
	63	**Unit-6 Atomic Structure, Chemical Bonding and Solutions** Rutherford model of atom and its failures,
	64	Bohr's theory (expression of energy and radius to be omitted),
17th	65	hydrogen spectrum explanation based on Bohr's model of atom
	66	Quantum numbers – orbital concept. Shapes of s, p and d orbitals
	67	Pauli's exclusion principle
	68	Heisenberg uncertainty principle
	69	Aufbau principle

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	70	Hund`s rule of maximum multiplicity
	71	electronic configurations (up to atomic number 30)
	72	Concept of chemical bonding – cause of chemical bonding
19th	73	types of bonds: ionic bonding (NaCl example)
	74	covalent bond (H2, F2, HF),
	75	Basic concept of orbital overlapping sigma and pi bonds, Concept of hybridization, hybridization in BeCl2, BF3, CH4, NH3, H2O),
	76	Coordination bond inNH4 + ion
20th	77	metallic bonding
	78	Hydrogen bond and anomalous properties of NH3, H2O due to hydrogen bonding,
	79	Solution – idea of solute, solvent and solution,
	80	methods to express the concentration of solution normality, molarity, molality
21st	81	Simple numerical baesed on normality, molarity, molality-
	82	methods to express the concentration of solution ppm, mass percentage, volume percentage and mole fraction.(with Simple numerical)
	83	Simple numerical baesed on ppm, mass percentage, volume percentage and mole fraction.
	84	**Unit-7 Water and Water Treatment** Graphical presentation of water distribution on Earth (pie or bar diagram) Classification as soft and hard water
22nd	85	Causes of hardness, unit of hardness
	86	simple numerical on water hardness and conversion
	87	Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler scale and sludge
	88	problems caused by the use of hard water in boiler foaming and priming, corrosion
23rd	89	Quantitative measurement of water hardness by ETDA method, total dissolved solids (TDS)
	90	Quantitative measurement of water hardness by total dissolved solids (TDS)
	91	Quantitative measurement of water hardness by alkalinity estimation.
	92	Water softening techniques – zeolite process
24th	93	Water softening techniques – soda lime process, zeolite process and ion exchange process.
	94	Water softening technique – ion exchange process.
	95	Municipal water treatment (in brief only) – sedimentation, coagulation, filtration
	96	Municipal water treatment – sterilization
25th	97	**UNIT-8: Engineering Materials** Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix)flux, slag
	98	Metallurgy – brief account of general principles of metallurgy.
	99	Alloys – definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples
	100	properties and applications of Brass, Bronze, Stainless Steel
	101	properties and applications of Alnico, Duralumin.

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26th	102	Polymers – monomer, homo and co polymers, degree of polymerization,
	103	addition polymerization and condensation polymerization
	104	Simple reactions involved in preparation and their application of thermoplastics plastics using PVC, PS, PTFE
	105	Simple reactions involved in preparation and their application of thermosetting plastics using nylon – 6, nylon-6,6
27th	106	Simple reactions involved in preparation and their application of thermosetting plastics using Bakelite
	107	Rubber and vulcanization of rubber. Advantages of vulcanized rubber over natural rubber.
	108	**Unit-9 Ecosystem** Structure of ecosystem, Biotic & Abiotic components
	109	Food chain & Food web
28th	110	Aquatic (Lentic and Lotic) ecosystem
	111	Terrestrial (grassland, forest, desert) ecosystem
	112	Carbon, Nitrogen Cycles
	113	Sulphur, Phosphorus cycle.
29th	114	Global warming -Causes, effects, process Green House Effect, Ozone depletion
	115	**Class Test**
	116	**Unit– 10 Renewable sources of Energy** Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector.
	117	Importance of coating. Advanced collector
30th	118	Solar pond. Solar water heater
	119	Solar dryer. Solar stills
	120	Biomass: Overview of biomass as energy source, Thermal characteristics of biomass as fuel
	121	Anaerobic digestion. Biogas production mechanism
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	123	Wind energy: future prospects of wind energy.
	124	Wind energy in India. Environmental benefits and problem of wind energy.
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1.Applied Chemistry by Dr. Anju Rawlley (Download from https://ekumbh.aicteindia.org/dbook.php)
2.Agarwal, & Shikha, Engineering Chemistry, Cambridge University Press; New Delhi, 2015
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31/07/26

Concerned faculty
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	128	Concept, origin and power plants of geothermal energy

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