

Government Polytechnic, Sonpur
Academic Lesson Plan for 1st Year – 2026-27

Name of the faculty: Kishan Kumar Agrawal, Lecturer (Stage II), Chemistry
 Dept.: Department of Mathematics & Science

Subject : Th 3 : Applied Chemistry & Environmental science

No of Periods per Week: 4

Total Periods: 128

End semester Exam: 70 Marks

Progressive Assessment: 30 Marks

Total Marks: 100 Marks

Week	Period	Unit / Chapter	Topics to be covered
1 st	1 st	Unit-1 Air and Noise pollution	Definition of pollution and pollutants, natural & man- made sources of air pollution(refrigerants, I.c boilers)
	2 nd	Unit-1 Air and Noise pollution	Air pollutants: types, particulate pollutants, its effects & Control methods
	3 rd	Unit-1 Air and Noise pollution	Briefly about the control methods: bag filters, cyclone separators.
	4 th	Unit-1 Air and Noise pollution	Briefly about the control methods:, electrostatic precipitator.
2 nd	1 st	Unit-1 Air and Noise pollution	Recap about the control measures of air pollution and introduction of gaseous pollution control.
	2 nd	Unit-1 Air and Noise pollution	Gaseous pollution control (catalytic convertor)
	3 rd	Unit-1 Air and Noise pollution	Effects of air pollution due to I.c refrigerants, boilers
	4 th	Unit-1 Air and Noise pollution	Sources of noise pollution & its effects.
3 rd	1 st	Unit-1 Air and Noise pollution	Regulation and control of noise pollution.
	2 nd	Unit-1 Air and Noise pollution	Question Answer Discussion

	3 rd	Unit-2 Water and soil pollution	Introduction of water pollution and its types.
	4 th	Unit-2 Water and soil pollution	characteristics of water pollutants turbidity ,pH Total suspended solids(TSS) and total solids,
4th	1 st	Unit-2 Water and soil pollution	biological oxygen demand(BOD) And chemical oxygen demand (COD) differences and calculation
	2 nd	Unit-2 Water and soil pollution	Introduction of waste water treatment and management.
	3 rd	Unit-2 Water and soil pollution	(i)Primary methods(sedimentation, forth floatation)
	4 th	Unit-2 Water and soil pollution	(ii)secondary methods: (activated sludge treatment, trickling ,filter, bio reactor)
5th	1 st	Unit-2 Water and soil pollution	Tertiary methods: membrane separation technology , reverse osmosis(RO).
	2 nd	Unit-2 Water and soil pollution	About soil pollution and its causes.
	3 rd	Unit-2 Water and soil pollution	Effects of Soil Pollution & its Preventive measures
	4 th	Unit-2 Water and soil pollution	e-waste and its control measures.
6th	1 st	Unit-2 Water and soil pollution	Monthly test
	2 nd	Unit-2 Water and soil pollution	Question Answer Discussion.

	3 rd	Unit-3 Solid Waste Management	Solid waste generation –sources and characteristics with examples
	4 th	Unit-3 Solid Waste Management	Briefly about Municipal solid waste ,E-waste (advantages and disadvantages)
7th	1 st	Unit-3 Solid Waste Management	Recap about solid waste and E-waste ,Bio-medical waste with example
	2 nd	Unit-3 Solid Waste Management	Metallic waste and non- metallic waste(lubricants ,plastics ,rubber) from industries and sources.
	3 rd	Unit-3 Solid Waste Management	Collection and disposal: MSW (3R) reuse, recycle, reduce and its principles.
	4 th	Unit-3 Solid Waste Management	Energy recovery, sanitary landfill (causes and sources).
8th	1 st	Unit-3 Solid Waste Management	About various hazardous waste(causes and sources) and prevention
	2 nd	Unit-3 Solid Waste Management	Concept of Carbon Credit & Carbon Footprint
	3 rd	Unit-3 Solid Waste Management	Environmental management in fabrication industry.
	4 th	Unit-3 Solid Waste Management	Question Answer Discussion.
9th	1 st	Unit-4 Electrochemistry & Corrosion	Utilization and storage of biogas. Little idea about wind energy.
	2 nd	Unit-4 Electrochemistry & Corrosion	Introduction of wind energy (merits and demerits) and its application & its working.
	3 rd	Unit-4 Electrochemistry & Corrosion	Current status and future prospects of wind energy.

	4 th	Unit-4 Electrochemistry & Corrosion	Recap of previous topic & Environmental benefits and problems of wind energy.
10 th	1 st	Unit-4 Electrochemistry & Corrosion	Electronic Concept of oxidation, reduction and redox reactions
	2 nd	Unit-4 Electrochemistry & Corrosion	Definition of Electrolytes and non- electrolytes with Examples
	3 rd	Unit-4 Electrochemistry & Corrosion	Faraday's 1 st and 2 nd law of Electrolysis
	4 th	Unit-4 Electrochemistry & Corrosion	Simple Numerical Problems of Faraday's law
11 th	1 st	Unit-4 Electrochemistry & Corrosion	Industrial application of Electrolysis
	2 nd	Unit-4 Electrochemistry & Corrosion	Applications of redox reactions in electrochemical cells
	3 rd	Unit-4 Electrochemistry & Corrosion	Different types of cells
	4 th	Unit-4 Electrochemistry & Corrosion	Definition and Types of Corrosion
12 th	1 st	Unit-4 Electrochemistry & Corrosion	H₂ liberation and O₂ absorption mechanism of electrochemical corrosion
	2 nd	Unit-4 Electrochemistry & Corrosion	Factors affecting rate of corrosion
	3 rd	Unit-4 Electrochemistry & Corrosion	Preventive measures for internal corrosion
	4 th	Unit-4 Electrochemistry & Corrosion	Preventive measures for external corrosion

13th	1 st	Unit-5 Chemistry of Fuels and Lubricants	Definition and classification of fuel
	2 nd	Unit-5 Chemistry of Fuels and Lubricants	Calorific value of fuel, Dulong's formula
	3 rd	Unit-5 Chemistry of Fuels and Lubricants	Liquid Fuels Petrol & Diesel
	4 th	Unit-5 Chemistry of Fuels and Lubricants	Composition and uses of different Fuels
14th	1 st	Unit-5 Chemistry of Fuels and Lubricants	Elementary idea about LPG, CNG and coal gas
	2 nd	Unit-5 Chemistry of Fuels and Lubricants	Definition and Types of lubricant
	3 rd	Unit-5 Chemistry of Fuels and Lubricants	Lubrication Mechanisim (Hydrodynamic Lubrication)
	4 th	Unit-5 Chemistry of Fuels and Lubricants	Lubrication Mechanisim (Boundary Lubrication)
15th	1 st	Unit-5 Chemistry of Fuels and Lubricants	Physical properties (viscosity and viscosity index, oiliness) of Lubricants
	2 nd	Unit-5 Chemistry of Fuels and Lubricants	Physical properties (flash and fire point, cloud and pour point) of Lubricants
	3 rd	Unit-5 Chemistry of Fuels and Lubricants	Chemical properties of Lubricants.
	4 th	Unit-5 Chemistry of Fuels and Lubricants	characteristic properties of good lubricant
16th	1 st	Unit-5 Chemistry of Fuels and Lubricants	Revision
	2 nd	Unit-5 Chemistry of Fuels and Lubricants	Revision
	3 rd	Unit-6 Atomic Structure,	Rutherford's Atomic model of atom and its failures

		Chemical Bonding and Solutions	
	4 th	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Bohr's Atomic model of Atom
17 th	1 st	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Quantum Numbers
	2 nd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Shapes of s,p and d orbitals
	3 rd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Heisenberg Uncertainty Principle
	4 th	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Rules for writing Electronic Configuration
18 th	1 st	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Electronic configurations (up to atomic number 30)
	2 nd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Concept of chemical bonding
	3 rd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Types of bonds: ionic bonding(NaCl example), covalent bond (H ₂ , F ₂ , HF)
	4 th	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Basic concept of orbital overlapping of sigma and pi bonds
19 th	1 st	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Concept of hybridization
	2 nd	Unit-6 Atomic Structure, Chemical Bonding	Hybridization in BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O)

	3 rd	and Solutions Unit-6 Atomic Structure, Chemical Bonding and Solutions	Coordination bond in NH_4^+ ion
	4 th	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Metallic bonding
20th	1 st	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Hydrogen bonding
	2 nd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Anomalous properties of NH_3 and H_2O due to hydrogen bonding
	3 rd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Solution - idea of solute, solvent and solution
	4 th	Unit-6 Atomic Structure, Chemical Bonding and Solutions	methods to express the concentration of solution
21th	1 st	Unit-6 Atomic Structure, Chemical Bonding and Solutions	normality, molarity, molality, ppm
	2 nd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Numericals on normality, molarity, molality, ppm
	3 rd	Unit-6 Atomic Structure, Chemical Bonding and Solutions	Mass percentage, volume percentage and mole fraction
	4 th	Unit-7 Water and Water Treatment	Graphical presentation of water distribution on Earth
22th	1 st	Unit-7 Water and Water Treatment	Classification of soft and hard water
	2 nd	Unit-7	Causes and units of hardness

		Water and Water Treatment	
	3 rd	Unit-7 Water and Water Treatment	simple numerical on water hardness and conversion
	4 th	Unit-7 Water and Water Treatment	Cause of poor lathering of soap in hard water
23th	1 st	Unit-7 Water and Water Treatment	problems caused by the use of hard water in boiler
	2 nd	Unit-7 Water and Water Treatment	scale and sludge, foaming and priming, corrosion
	3 rd	Unit-7 Water and Water Treatment	Quantitative measurement of water hardness by ETDA method
	4 th	Unit-7 Water and Water Treatment	total dissolved solids (TDS) alkalinity estimation.
24th	1 st	Unit-7 Water and Water Treatment	Water softening techniques- sodalime process
	2 nd	Unit-7 Water and Water Treatment	Zeolite process and ion exchange process
	3 rd	Unit-7 Water and Water Treatment	Municipal water treatment, Sedimentation, coagulation, filtration, sterilization
	4 th	Unit-7 Water and Water Treatment	Monthly test
25th	1 st	Unit-8 Engineering Materials	Natural occurrence of metals
	2 nd	Unit-8 Engineering Materials	minerals, ores of iron, aluminium and copper
	3 rd	Unit-8 Engineering Materials	Brief account of general principles of metallurgy
	4 th	Unit-8 Engineering Materials	definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples

26th	1 st	Unit-8 Engineering Materials	properties and applications of Brass, Bronze, Stainless Steel, Alnico, Duralumin
	2 nd	Unit-8 Engineering Materials	Polymers- monomer, homo and copolymers, degree of polymerization
	3 rd	Unit-8 Engineering Materials	Addition polymerization and condensation polymerization
	4 th	Unit-8 Engineering Materials	Preparation and their application of thermoplastics and thermosetting plastics
27th	1 st	Unit-8 Engineering Materials	PVC, PS, PTFE, nylon - 6, nylon-6,6 and Bakelite
	2 nd	Unit-8 Engineering Materials	Rubber and vulcanization of rubber
	3 rd	Unit-8 Engineering Materials	Advantages of vulcanized rubber over natural rubber
	4 th	Unit-9 Ecosystem	Structure of ecosystem, Biotic & Abiotic components
28th	1 st	Unit-9 Ecosystem	Food chain and food web
	2 nd	Unit-9 Ecosystem	Aquatic(Lentic and Lotic) and terrestrial ecosystem(grassland, forest, desert)
	3 rd	Unit-9 Ecosystem	Carbon & Nitrogen cycle
	4 th	Unit-9 Ecosystem	Sulphur & Phosphorus cycle
29th	1 st	Unit-9 Ecosystem	Global warming- Causes, effects, process
	2 nd	Unit-9 Ecosystem	Green House Effect, Ozone depletion
	3 rd	Unit-9 Ecosystem	Question & Answer Discussion
	4 th	Unit-10 Renewable sources of Energy	Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector
30th	1 st	Unit-10	Importance of coating. Advanced collector

		Renewable sources of Energy	
	2 nd	Unit-10 Renewable sources of Energy	Solar pond. Solar water heater, solar dryer, Solar stills.
	3 rd	Unit-10 Renewable sources of Energy	Overview of biomass as energy source. Thermal characteristics of biomass as fuel
	4 th	Unit-10 Renewable sources of Energy	Anaerobic digestion. Biogas production mechanism and Utilization
31 th	1 st	Unit-10 Renewable sources of Energy	Question & Answer Discussion
	2 nd	Unit-10 Renewable sources of Energy	Future prospects of wind energy.
	3 rd	Unit-10 Renewable sources of Energy	Wind energy in India
	4 th	Unit-10 Renewable sources of Energy	Environmental benefits and problem of wind energy.
32 th	1 st	Unit-10 Renewable sources of Energy	Need of new sources. Different types new energy sources
	2 nd	Unit-10 Renewable sources of Energy	Hydrogen energy, Tidal energy conversion
	3 rd	Unit-10 Renewable sources of Energy	Concept, origin and power plants of geothermal energy
	4 th	Unit-10 Renewable sources of Energy	Doubt Clearing Class

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