

LESSON PLAN

**NAME OF THE TEACHING FACULTY: SARA GANTA
(GUEST FACULTY IN CHEMISTRY)**

Session: 2026 – 27

Course Name: Applied Chemistry and EVS	Progressive Assessment: 30 Marks
Course Code: TH-3	Final Exam: 70 Marks
Periods per Week: 04	Duration of End Exam: 3 Hours
Total Periods: 128	No of Credits: 04
Duration: 17/08/2026 to 17/04/2027	

Periods	Week	Class Day	UNIT	Topics to be covered
1	1 st	1 st	1. Air Pollution and Noise Pollution	1.1 Definition of pollution and pollutant, classification of pollutant (primary and secondary),
2		2 nd		Natural and man-made sources of air pollution.
3		3 rd		1.2 Air Pollutants: Types, Particulate Pollutants:
4		4 th		Effects of air pollution.
5	2 nd	1 st		Control of air pollution (Bag filter, Cyclone separator, Electrostatic Precipitator)
6		2 nd		1.3 Gaseous Pollution Control: Catalytic Converter, Effects of air pollution due to Refrigerants, I.C., Boiler
7		3 rd		1.4 Noise pollution: Definition, sources of pollution,
8		4 th		Effects of noise pollution.
9	3 rd	1 st		Control of Noise Pollution.
10		2 nd		DOUBT CLEARANCE CLASS
11		3 rd		2.1 Sources of water pollution, Types of water pollutants,
12		4 th		2.2 Characteristics of water pollutants Turbidity, pH,
13	4 th	1 st	2. Water and Soil Pollution	Total suspended solids, total solids BOD and COD,
14		2 nd		2.3 Waste Water Treatment: Primary methods: sedimentation, froth floatation,
15		3 rd		Secondary methods, Activated sludge treatment, Bioreactor, Tertiary Method: Membrane separation technology, RO (reverse osmosis).
16		4 th		2.4 Soil Pollution: Definition, Causes, Effects
17	5 th	1 st		Preventive measures of Soil Pollution

18		2 nd		2.5 Effects of Excessive use of Fertilizers, Pesticides and Insecticides,
19		3 rd		Irrigation, E-Waste on soil pollution.
20		4 th		DOUBT CLEARANCE CLASS
21	6 th	1 st	UNIT-3: Solid Waste Management	3.0 Solid waste generation- Sources and characteristics of: Municipal solid waste,
22		2 nd		E- waste, biomedical waste. Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.
23		3 rd		3.1 Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill),
24		4 th		Hazardous waste.
25	7 th	1 st		3.2 Concept of Carbon Credit, Carbon Footprint.
26		2 nd		3.3 Environmental management in fabrication industry.
27		3 rd		DOUBT CLEARANCE CLASS
28		4 th		
29	8 th	1 st		4.1 Electronic concept of oxidation, reduction and redox reactions.
30		2 nd		4.2 Definition of terms: electrolytes, non-electrolytes with suitable examples,
31		3 rd		4.3 Faradays laws of electrolysis and simple numerical problems.
32		4 th		4.4 Industrial Application of Electrolysis – Electrometallurgy, Electroplating, Electrolytic refining.
33	9 th	1 st	UNIT-4: Electrochemistry & Corrosion.	4.5 Application of redox reactions in electrochemical cells – Primary cells – dry cell,
34		2 nd		Secondary cell - commercially used lead storage battery and fuel cells.
35		3 rd		4.6 Introduction to Corrosion of metals - definition, types of corrosion (chemical and electrochemical),
36		4 th		H ₂ liberation and O ₂ absorption mechanism of electrochemical corrosion,
37	10 th	1 st		Factors affecting rate of corrosion.
38		2 nd		4.7 Internal corrosion preventive measures – Purification, alloying and heat treatment
39		3 rd		External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.
40		4 th		DOUBT CLEARANCE CLASS
41	11 th	1 st	UNIT-5: Chemistry of Fuels and Lubricants	5.1 Definition of fuel, classification of fuels, calorific values (HCV and LCV),
42		2 nd		5.2 Liquid fuels petrol and diesel - fuel rating (octane and cetane numbers),

43	12 th	3 rd	UNIT-6: Atomic Structure, Chemical Bonding and Solutions.	5.3 Chemical composition, calorific values and applications of LPG, CNG, water gas, producer gas, Coal gas, and biogas.
44		4 th		5.4 Lubricant – Definition, function, classification with examples,
45		1 st		5.5 Lubrication definition and mechanism (hydrodynamic and boundary lubrication)
46		2 nd		5.6 Physical properties (viscosity and viscosity index, oiliness, flash and fire point, cloud and pour point only)
47	13 th	3 rd		Chemical properties (coke number, total acid number saponification value) of lubricants, characteristic properties of good lubricant.
48		4 th		DOUBT CLEARANCE CLASS
49		1 st		6.1 Rutherford model of atom and its failures.
50		2 nd		6.2 Bohr's theory (expression of energy and radius to be omitted),
51		3 rd		hydrogen spectrum explanation based on Bohr's model of atom,
52		4 th		6.3 Quantum numbers.
53	14 th	1 st		Orbital concept. Shapes of s, p and d orbitals,
54		2 nd		6.4 Pauli's exclusion principle,
55		3 rd		Heisenberg uncertainty principle, Aufbau principle,)
56		4 th		Electronic configurations (up to atomic number 30). Hund's rule of maximum multiplicity.
57	15 th	1 st		6.5 Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding (NaCl example),
58		2 nd		Covalent bond (H ₂ , F ₂ , HF), 6.6 Basic concept of orbital overlapping sigma and pi bonds,
59		3 rd		Concept of hybridization, hybridization in BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O),
60		4 th		6.7 Coordination bond in NH ₄ ⁺ ion, metallic bonding.
61	16 th	1 st		6.8 Hydrogen bond and anomalous properties of NH ₃ , H ₂ O due to hydrogen bonding,
62		2 nd		6.9 Solution – idea of solute, solvent and solution, methods to express the concentration of solution, molarity, normality,
63		3 rd		molality, ppm, mass percentage, volume percentage and mole fraction.(with Simple numerical)
64		4 th		
65	17 th	1 st		

66		2 nd		DOUBT CLEARANCE CLASS
67		3 rd		DOUBT CLEARANCE CLASS
68		4 th		7.1 Graphical presentation of water distribution on Earth (pie or bar diagram). Classification as soft and hard water,
69	18 th	1 st	UNIT-7: Water and Water Treatment.	7.2 Causes of hardness, unit of hardness and simple numerical on water hardness and conversion.
70		2 nd		7.3 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.),
71		3 rd		7.4 Quantitative measurement of water hardness by ETDA method,
72		4 th		Total dissolved solids (TDS) alkalinity estimation.
73	19 th	1 st		7.5 Water softening techniques – soda lime process,
74		2 nd		Zeolite process and ion exchange process.
75		3 rd		7.6 Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.
76		4 th		DOUBT CLEARANCE CLASS
77	20 th	1 st		DOUBT CLEARANCE CLASS
78		2 nd		8.1 Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix) flux, slag,
79		3 rd		8.2 Metallurgy – brief account of general principles of metallurgy.
80		4 th		8.3 Alloys – definition, purposes of alloying, ferrous alloys and nonferrous with suitable examples
81	21 st	1 st		Properties and applications of Brass, Bronze, Stainless Steel, Alnico, Duralumin.
82		2 nd		8.4 Polymers – monomer, homo and co polymers, degree of polymerization, addition polymerization and condensation polymerization,
83		3 rd		8.5 Simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE,
84		4 th		Nylon – 6, nylon-6, 6 and Bakelite),
85	22 nd	1 st	UNIT-8: Engineering Materials.	8.6 Rubber and vulcanization of rubber. Advantages of vulcanized rubber over natural rubber.
86		2 nd		DOUBT CLEARANCE CLASS
87		3 rd		DOUBT CLEARANCE CLASS

88	23 rd	4 th	UNIT-9: Ecosystem.	9.1 Structure of ecosystem, Biotic & Abiotic components Food chain and food web,
89		1 st		9.2 Aquatic (Lentic and Lotic)
90		2 nd		Terrestrial ecosystem: grassland, forest, desert),
91		3 rd		9.3 Carbon, Nitrogen,
92		4 th		Sulphur, Phosphorus cycle.
93	24 th	1 st		9.4 Global warming -Causes, effects, process, Green House Effect, Ozone depletion.
94		2 nd		DOUBT CLEARANCE CLASS
95		3 rd		DOUBT CLEARANCE CLASS
96		4 th		
97	25 th	1 st		10.1 Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector.
98		2 nd		Importance of coating. Advanced collector. Solar pond.
99		3 rd		Solar water heater, solar dryer. Solar stills.
100		4 th		10.2 Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel.
101	26 th	1 st	UNIT-10: Renewable sources of Energy	10.3 Anaerobic digestion. Biogas production mechanism and Utilization.
102		2 nd		10.4 Wind energy: Future prospects of wind energy. Wind energy in India. Environmental benefits and problem of wind energy.
103		3 rd		10.5 New Energy Sources: Need of new sources. Different types new energy sources.
104		4 th		Applications of (Hydrogen energy, Tidal energy conversion.)
105	27 th	1 st		Concept, origin and power plants of geothermal energy.
106		2 nd		DOUBT CLEARANCE CLASS
107		3 rd		DOUBT CLEARANCE CLASS
108		4 th		
109	28 th	1 st		UNIT – 6 REVISION
110		2 nd		UNIT – 6 REVISION
111		3 rd		UNIT – 6 REVISION
112		4 th		UNIT – 7 REVISION
113	29 th	1 st		UNIT – 7 REVISION
114		2 nd		UNIT – 8 REVISION
115		3 rd		UNIT – 8 REVISION
116		4 th		UNIT – 8 REVISION
117	30 th	1 st		UNIT – 9 REVISION
118		2 nd		UNIT – 9 REVISION

119		3 rd		UNIT – 10 REVISION
120		4 th		UNIT – 10 REVISION
121	31 st	1 st		UNIT – 10 REVISION
122		2 nd		PROBABLE QUESTIONS-ANSWERS DISCUSSION
123		3 rd		PROBABLE QUESTIONS-ANSWERS DISCUSSION
124		4 th		PROBABLE QUESTIONS-ANSWERS DISCUSSION
125	32 nd	1 st		PROBABLE QUESTIONS-ANSWERS DISCUSSION
126		2 nd		PROBABLE QUESTIONS-ANSWERS DISCUSSION
127		3 rd		PROBABLE QUESTIONS-ANSWERS DISCUSSION
128		4 th		PROBABLE QUESTIONS-ANSWERS DISCUSSION

Sarita Cranta

SIGN OF THE TEACHING FACULTY

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GOVT. POLYTECHNIC, GAJAPATI
LESSON PLAN OF APPLIED CHEMISTRY LAB

Session: 2026 – 27

Discipline: All			Name of the Faculty : SARA GANTA, GUEST FACULTY(CHEMISTRY)
SUBJECT: APPLIED CHEMISTRY LAB			From date -17-8-2026 to 17-4-2027 , No of week -35 (excluding Holidays)
WEEK	No. of days / aloted class per week:2	Unit no.	Topics to be Covered(Practical)
1st	1st		Demonstration To Prepare the standard solution of oxalic acid or potassium permanganate
2nd	2nd		Lab practice To Prepare the standard solution of oxalic acid or potassium permanganate
3rd	3rd		Demonstration To determine the strength of given sodium Hydroxide solution by titrating against standard oxalic acid solution using Phenolphthalein Indicator
4th	4th		Lab practice To determine the strength of given sodium Hydroxide solution by titrating against standard oxalic acid solution using Phenolphthalein Indicator
5th	1st		Demonstration to Estimate the total hardness of given water sample using standard ethylene diamine tetra acetic acid (EDTA) solution
6th	2nd		Lab practice Estimate the total hardness of given water sample using standard ethylene diamine tetra acetic acid (EDTA) solution
7th	3rd		Demonstration and Lab practice Determine the alkalinity of a given water sample using 0.01M sulphuric acid.
8th	1st		Lab practice Determine the alkalinity of a given water sample using 0.01M sulphuric acid.
9th	2nd		Demonstration of Determine total acid number (TAN) of given oil
10th	3rd		Lab practice Determine total acid number (TAN) of given oil
11th	4th		Demonstration To Determine the percentage of iron in haematite ore by standard KMnO_4 solution
12th	1st		Lab practice To Determine the percentage of iron in haematite ore by standard KMnO_4 solution
13th	2nd		Demonstration To Estimate Iodometrically copper in the copper pyrite ore.
14th	3rd		Lab practice To Estimate Iodometrically copper in the copper pyrite ore.
15th	1st		Demonstration to Determine the Iron contents in given cement sample using colorimeter.
16th	2nd		Lab practice to Determine the Iron contents in given cement sample using colorimeter.
17th	3rd		Demonstration To Determine the conductivity of given water sample.
18th	4th		Lab practice To Determine the conductivity of given water sample.
19th	1st		Demonstration To Verify the Faraday's first law of electrolysis of copper sulphate solution using copper electrode.
20th	2nd		Lab practice To Verify the Faraday's first law of electrolysis of copper sulphate solution using copper electrode.
21st	3rd		Demonstration To Determine the emf using an electrochemical cell (Daniel Cell)

22nd	4th		Lab practice To Determine the emf using an electrochemical cell (Daniel Cell)
23rd	1st		Demonstration and Lab practice To Determine the effect of connection of two dissimilar metals immersed in solution.
24th	2nd		Lab practice To Determine the effect of connection of two dissimilar metals immersed in solution
25th	3rd		Demonstration Determination of amount of dissolved chlorine present in a water sample.
26th	4th		Lab practice of Determination of amount of dissolved chlorine present in a water sample.
27th	1st		Lab practice of Determination of amount of turbidity present in a water sample.
28th	2nd		Lab practice Determination of amount of turbidity present in a water sample.
29th	3rd		Demonstration of Determination of amount of TDS present in a water sample.
30th	4th		Lab practice Determination of amount of TDS present in a water sample.
31st	1st		Demonstration of Determination of amount of BOD present in a water sample.
32nd	2nd		Lab practice of Determination of amount of BOD present in a water sample.
33rd	3rd		Practical related question answer Discussion
34th	4th		Practical related question answer Discussion
35th	1st		Practical related question answer Discussion

Sana Granta

Signature of

Concerned Faculty

Sutono
31/7/26
H.O.D

Humanities & Science