

UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY,
RAYAGADA Academic Lesson Plan for 1ST year – 2026

Name of the teaching faculty: Miss Tapaswini Panda,
Guest faculty (Chemistry)
Dept. : Department of Mathematics & Science
Semester : 1st
Subject : Pr 3 : Applied Chemistry Laboratory
Date : 17-08-26 to 17-04-27
No of Periods per week: 2
End semester Exam.: 25 Marks, Total Periods: 64,

Week	Period	Experiment	Topics to be covered
1st	1st	Introduction and safety measures	Introduction to chemistry lab, about safety measures, about maintenance of practical records.
	2nd	Introduction and safety measures	Introduction to the students about use of different lab equipments and how to handle them safely.
2nd	1st	Exp. 1 Preparation of Standard Solution	Aim, apparatus, principle and procedure. Preparation of standard solution of oxalic acid or potassium permanganate.
	2nd	Exp. 1 Preparation of Standard Solution	Perform the experiment, record observations, calculations and result. Study apparatus, preparation procedure, calculations and precautions; complete observation and result.
3rd	1st	Exp. 2 Strength of Sodium Hydroxide	Aim, apparatus, principle and procedure. Determine strength of given sodium hydroxide solution by titrating against standard oxalic acid using phenolphthalein indicator.
	2nd	Exp. 2 Strength of Sodium Hydroxide	Perform the experiment, record observations, calculations and result. Perform acid-base titration, record burette readings, calculate strength and

			complete practical record.
4th	1st	Exp. 3 Standardization of KMnO_4	Aim, apparatus, principle and procedure. Standardize KMnO_4 solution using standard oxalic acid and determine percentage of iron present in given hematite ore by KMnO_4 solution.
	2nd	Exp. 3 Standardization of KMnO_4	Perform the experiment, record observations, calculations and result. Perform redox titration, record readings and calculate concentration/percentage of iron.
5th	1st	Exp. 4 Iodometric Estimation of Copper	Aim, apparatus, principle and procedure. Determine copper in copper pyrite ore by iodometric estimation.
	2nd	Exp. 4 Iodometric Estimation of Copper	Perform the experiment, record observations, calculations and result. Study iodometric principle, perform titration, calculate copper content and note precautions.
6th	1st	Exp 5 Water Hardness and Alkalinity	Aim, apparatus, principle and procedure. Determine total hardness of water using standard EDTA solution and alkalinity using standard 0.01 M sulphuric acid.
	2nd	Exp 5 Water Hardness and Alkalinity	Perform the experiment, record observations, calculations and result. Perform EDTA complexometric titration and alkalinity determination; calculate water-quality values.
7th	1st	Exp. 6 Iodometric Estimation of Oil	Aim, apparatus, principle and procedure. Determine total acid number (TAN) of given oil.
	2nd	Exp. 6 Iodometric	Perform the experiment, record observations, calculations and result.

		Estimation of Oil	Perform titration for TAN, calculate acid number and interpret the result.

8th	1st	Exp. 7 Conductivity of Water	Aim, apparatus, principle and procedure. Determine the conductivity of a given water sample.
	2nd	Exp. 7 Conductivity of Water	Perform the experiment, record observations, calculations and result. Study conductivity measurement, operate the instrument, record readings and determine conductivity.
9th	1st	Exp. 8 Cement Content by Colorimetry	Aim, apparatus, principle and procedure. Determine the conductivity of a given water sample.
	2nd	Exp. 8 Cement Content by Colorimetry	Perform the experiment, record observations, calculations and result. Study conductivity measurement, operate the instrument, record readings and determine conductivity.
10th	1st	Exp. 9 Calorific Value of Fuel	Aim, apparatus, principle and procedure. Determine calorific value of solid or liquid fuel using bomb calorimeter.
	2nd	Exp. 9 Calorific Value of Fuel	Perform the experiment, record observations, calculations and result. Study bomb calorimeter, perform measurement, apply calculation and determine calorific value.
11th	1st	Exp. 10 Viscosity of Lubricating Oil	Aim, apparatus, principle and procedure. Determine viscosity of lubricating oil using Redwood viscometer.
	2nd	Exp. 10 Viscosity of	Perform the experiment, record observations, calculations and result.

		Lubricating Oil	Study Redwood viscometer, measure flow time and calculate/compare viscosity.
12th	1st	Exp. 11 Flash and Fire Point of Lubricating Oil	Aim, apparatus, principle and procedure. Determine flash point and fire point of lubricating oil using Abel's flash point apparatus.
	2nd	Exp. 11 Flash and Fire Point of Lubricating Oil	Perform the experiment, record observations, calculations and result. Study apparatus and safety procedure, perform heating test and determine flash/fire points.
13th	1st	Exp. 12 Faraday's First Law	Aim, apparatus, principle and procedure. Verify the first law of electrolysis of copper sulphate solution.
	2nd	Exp. 12 Faraday's First Law	Perform the experiment, record observations, calculations and result. Set up electrolysis cell, take mass/current/time observations and verify Faraday's first law.
14th	1st	Exp. 13 EMF of Daniel Cell	Aim, apparatus, principle and procedure. Construct and measure EMF of an electrochemical cell (Daniel cell).
	2nd	Exp. 13 EMF of Daniel Cell	Perform the experiment, record observations, calculations and result. Study cell construction and electrode arrangement, measure EMF and record result.
15th	1st	Exp. 14 Dissolved Chlorine	Aim, apparatus, principle and procedure. Determine amount of dissolved chlorine present in a water sample.
	2nd	Exp. 14 Dissolved Chlorine	Perform the experiment, record observations, calculations and result. Perform chlorine estimation, record

			readings and calculate dissolved chlorine.
16th	1st	Exp. 15 Turbidity of Water	Aim, apparatus, principle and procedure. Determine amount of turbidity present in a water sample.
	2nd	Exp. 15 Turbidity of Water	Perform the experiment, record observations, calculations and result. Use the appropriate turbidity measurement method/instrument, record reading and report turbidity.
17th	1st	Exp. 16 TDS of Water	Aim, apparatus, principle and procedure. Determine amount of TDS present in a water sample.
	2nd	Exp. 16 TDS of Water	Perform the experiment, record observations, calculations and result. Measure total dissolved solids using the appropriate method/instrument and report TDS.

18th	1st	Revision / Assessment	Revision of standardisation of oxalic acid or potassium permanganate.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
19th	1st	Revision / Assessment	Revision of determination of strength of given sodium hydroxide solution by titrating against standard oxalic acid using phenolphthalein indicator.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
20th	1st	Revision /	Revision of Standardisation of KMnO_4 solution using standard oxalic acid and

		Assessment	determine percentage of iron present in given hematite ore by KMnO_4 solution.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
21 st	1st	Revision / Assessment	Revision of redox and iodometric titrations; numerical practice and viva questions.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
22 nd	1st	Revision / Assessment	Revision of complexometric titration: EDTA method, hardness and alkalinity calculations.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
23 rd	1st	Revision / Assessment	Revision of Determination total acid number (TAN) of given oil.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
24 th	1st	Revision / Assessment	Revision of Determination the conductivity of a given water sample.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
25 th	1st	Revision / Assessment	Revision of . Determine calorific value of solid or liquid fuel using bomb calorimeter.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.

26th	1st	Revision / Assessment	Revision of Determine viscosity of lubricating oil using Redwood viscometer.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
27th	1st	Revision / Assessment	Revision of Determination flash point and fire point of lubricating oil using Abel's flash point apparatus.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
28th	1st	Revision / Assessment	Revision of Verify the first law of electrolysis of copper sulphate solution
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
29th	1st	Revision / Assessment	Revision of Construct and measure EMF of an electrochemical cell (Daniel cell).
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
30th	1st	Revision / Assessment	Revision of Determine amount of dissolved chlorine present in a water sample
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
31 st	1st	Revision / Assessment	Revision of Determine amount of turbidity present in a water sample.

	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.
32 nd	1st	Revision / Assessment	Revision of Determine amount of TDS present in a water sample.
	2nd	Revision / Assessment	Practical demonstration, record verification, viva voce and doubt clarification related to the above experiments.

Tapaswini Panda

Miss. Tapaswini Panda
Guest faculty (Chemistry),

R. B. Singh
17/8/26

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