Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa		
Name of Faculty: Dr. Dipesh Sakharam Harmalkar	**Subject: Basics of Chemical Laboratory Management**	
Paper code: CHC 221	**Program: S.Y.BSc.**	**Division:**
Academic year: 2025 - 2026	**Semester: IV**	**Total Practical/Labs: 13 (30 h)**
Credits: 1		

Course Objectives:

- Enable student to identify and classify different glass wares
- To prepare solution of different concentration and dilution
- Distinguish between different types of electrodes
- Acquaint students with hazard symbols and labels

Expected Course Outcome:

At the end of the course students will be able to:

CO1: Identify and classify common glassware and apparatus, prepare standard solutions and know the basics of Identify and classify different glasswares

CO2: Prepare solution of different strength/volume and know the different terms used for labeling concentration

CO3: Identify and classify different types electrodes

CO4: Interpret hazard symbols and labels of supplied commercial chemicals

Student Learning Outcome:

At the end of the course students will be able to:

1. recognize and differentiate common laboratory glassware and apparatus while understanding their specific uses and the preparation of standard solutions.
2. prepare solutions of varying strengths and volumes, along with familiarity with the terms used for labeling concentrations.
3. identify and classify different types of electrodes used in experiments and their applications.
4. interpret hazard symbols and labels on commercial chemicals to ensure safe handling and adherence to laboratory safety protocols.

Month	Practical/Labs Scheduled Date	No. of Practical /Labs planned	List of Experiments	Reference books
December	11-12-2025	1 (Batch II)	1. Identification and classification of glassware: 1. To identify and classify different types of flasks and funnels (Minimum four different types of each.)	[1,2]
	18-12-2025	1 (Batch II)	2. Identification and classification of glassware: 2. To identify and classify different types of pipettes and burettes (Minimum two different types of each.)	[1,2]
January	08-01-2026	1 (Batch II)	3. Identification and classification of glassware: 3. Classification, Assembling and Application of condensers-Normal condenser (Liebig Condenser), Double coiled condenser, Hickman distilling head and fractional distillation	[1,2]
	15-01-2026	1 (Batch II)	4. Prepare 100 ml of 0.5 N NaOH solution and standardize using 0.5N KHP. Dilute and prepare 100 ml of 0.3N NaOH and standardize to determine correctness of dilution.	[1,2]
	22-01-2026	1 (Batch II)	5. Prepare 100ml 0.05 M KMnO4and dilute to 0.05 N KMnO4 solution.	[1,2]
	29-01-2026	1 (Batch II)	6. Dilute the given standard solution of 0.05 M oxalic acid to 0.02N, 0.025N, 0.03N.	[1,2]
February	05-02-2026	1 (Batch II)	7. Determination of mole fraction of Cu and Cl in a CuCl2. 2 H2O solution (0.010 g CuCl2.2 H2O diluted to 100 ml.)	[1,2]
	12-02-2026	1 (Batch II)	8. Preparation and dilution of 100 ppm Fe solution using any salt of iron and to dilute to 80 ppm and 50 ppm.	[1,2]
	19-02-2026	1 (Batch II)	9. Identification and classification of Electrode: 1. To identify and classify different types of Reference electrodes (any two)	[1,2]
	26-02-2026	1 (Batch II)	10. Identification and classification of Electrode: 2. To identify and classify different types of Working electrode (any Two)	[4]
March	05-03-2026	1 (Batch II)	11. Identification of labels and Hazard Symbols: 1. Draw the label and describe the information on commercial chemical and reagent labels- (Minimum two solids and two liquids)	[3]

	12-03-2026	1 (Batch II)	12. Identification of labels and Hazard Symbols: 2. Draw and identify the hazard symbols (ref-Safety datasheet (SDS), Globally Harmonized System (GHS) for hazard communication). Note-Minimum Nine Symbols to be studied.	[3]
	19-03-2026	1 (Batch II)	13. Identification of labels and Hazard Symbols: 3. Classification of fire and fire extinguisher	[3]
	26-03-2026	1 (Batch II)	Revision	[3]

References:

1. G.H. Jeffery, J. Bassett, J. Mendham, R. C. Denny. Vogel's Textbook of Quantitative Chemical Analysis, 5th edition, Longman Scientific and Technicals , England, 1989.
2. Brian S. Furniss, Antony J. Hannaford, Peter W.G.Smith, Austin R. Brian S. Furniss, Antony J. Hannaford, Peter W.G.Smith, Austin R. tatchell. Vogel Textbook of practical Organic chemistry,'s 5th edition, 8th impression 2011.
3. National Research council of Naional Academies, *Prudent Practices in Laboratory-handling and management of chemical hazards.* The National Academies press. Washington D.C 2001.
4. John O'M Bockris, Amulya K. Reddy *Modern Electrochemistry 1 Ionics ,* 2^{nd} Edition, Publisher-Springer, UK 1989.