Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa

Name of Faculty: Ms. Sampada P. Bhide	**Subject: Physical Chemistry I**	
Paper code: CHC – 204	**Program: S.Y.BSc.**	**Division:**
Academic year: 2024 - 2025	**Semester: IV**	**Total Practical/Labs: 15 (30 hours)**

Credits:1

Course Objectives:
1. To acquire knowledge on the various types of reactions and their order.
2. To understand the thermodynamic parameters used in laboratory techniques.
3. To study complex formation and determination of stability constant colorimetrically.

Expected Course Outcome:
At the end of the course students will be able to:
CO1 : Calculate and explain various thermodynamic parameters of chemical reactions.
CO2 : Differentiate between different nuclear counters.
CO3 : Estimate quantum yields of photochemical reactions.
CO4 : Compare the strength of the acids.
CO5 : Determine graphically order of reaction and estimate the energy of activation.
CO6 : Estimate the stability constant of various complexes.

Student Learning Outcome:
At the end of the course students will be able to:
1. calculate and articulate key thermodynamic parameters associated with chemical reactions.
2. distinguish among various types of nuclear counters and understand their operational differences.
3. estimate quantum yields in photochemical reactions and understand their significance.
4. evaluate and compare the relative strengths of acids based on scientific principles.
5. analyze reaction kinetics, graphically determine the order of reactions, and estimate activation energies.
6. calculate and interpret stability constants for various chemical complexes.

Month	Practical/Labs Scheduled Date	No. of Practical /Labs planned	List of Experiments	Reference books
January	06/01/25	1	3. To determine the rate constant and order of reaction between KI and K2S2O8	[1-6]
	13/01/25	1	3. To determine the rate constant and order of reaction between KI and K2S2O8	[1-6]
	20/01/25	1	4. Determination of enthalpy of ionization of Acetic acid and NaOH.	[1-6]
	27/01/2025	1	4. Determination of enthalpy of ionization of Acetic acid and NaOH.	[1-6]
February	03/02/2025	1	5. Determination of enthalpy of neutralization of Acetic acid and NaOH.	[1-6]
	10/02/2025	1	5. Determination of enthalpy of neutralization of Acetic acid and NaOH.	[1-6]
	17/02/2025	1	6. To study complex formation between Ni(II) and Ophenanthroline by Job's method. (Colorimetry)	[1-6]
	24/02/2025	1	7. To study the complex formation between Fe(III) ions and Salicylic acid and to find the formula and stability constant of the complex using colorimetry.	[1-6]
March	03/03/2025	1	7. To study the complex formation between Fe(III) ions and Salicylic acid and to find the formula and stability constant of the complex using colorimetry.	[1-6]
	10/03/2025	1	8. To measure the Combustion Enthalpies of Coal via Bomb Calorimetry.	[1-6]
	17/03/2025	1	8. To measure the Combustion Enthalpies of Coal via Bomb Calorimetry.	[1-6]

	24/03/2025	1	Repeat practicals	-
	31/03/2025	1	Repeat practicals	-
April	07/04/2025	1	Semester End Practical Examination	-

References:

1. S. W. Rajbhoj and T. K. Chondhekar, Systematic Experimental Physical Chemistry, Anjali Publication, 2nd Edition, 2000, Aurangabad.

2. Khosla, B. D.; Garg, V. C. &Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi, 2018, 18 th edition.

3. O. P. Pandey, D. N. Bajpai, S. Giri, Practical Chemistry, S. Chand Publication, 2013, New Delhi, Revised Edition.

4. B. Viswanathan, P. S. Raghavan, Practical Physical Chemistry, Viva Books Private limited, 2012, Mumbai.

5. J. N. Gurtu and A. Gurtu, Advanced Physical Chemistry Experiments, Pragati Prakashan, 2008, Meerut, Revised Edition.

6. A. M. Ranjika and P. Bopegedera, Evaluating the heats of combustion of coals using Bomb calorimetry in the general chemistry laboratory, J. Chem. Educ. 2023, 100, 1, 298 305

* Assessment Rubrics	
Component	**Max Marks**
ISA	15
Practical	25
Semester End Exam	60
Total	100