

Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa		
Name of Faculty: Dr. Sudesh M. Morajkar	Subject: Concepts in Inorganic and Physical Chemistry (Major)	
Paper code: CHC 206	Program: S.Y.BSc.	Division:
Academic year: 2026 - 2027	Semester: III	Total Practical/Labs: 15 (30 hours)
Credits: 1+2		
Course Objectives: - Examine the historical development of the periodic table and analyze periodic properties alongside their underlying trends. - Evaluate the postulates of Valence Bond Theory (VBT), Molecular Orbital Theory (MOT), and Valence Shell Electron Pair Repulsion (VSEPR) theory to understand the structural and characteristic properties of ionic and covalent compounds. - Investigate the fundamental laws governing crystallography and determine the structures of various cubic crystal systems. - Explore colligative properties in depth and analyze the principles and applications of the distribution law.		
Expected Course Outcome: At the end of the course students will be able: CO1: Define periodic properties and terms related to strength of solutions and analytical methods CO2: Understand the trend of periodic properties of elements, geometry of molecules, and stability of ionic solids. CO3: Construct and interpret the molecular orbital diagram of homonuclear and heteronuclear molecules, Also predict the colligative properties of different systems and calculate the distribution coefficient of binary systems, deduce the lattice parameters of crystalline solids. CO4: Apply the knowledge to determine certain properties of elements, molecules and systems, create and differentiate the same.		
Student Learning Outcome: At the end of the course students will be able: LO1: Explain covalent solid bonding using Valence Bond Theory, detailing the distinct features of sigma (σ) and pi (π) bonds. LO2: Predict the shapes of simple molecules using orbital hybridization and analyze the bond properties of homonuclear and heteronuclear diatomic molecules. LO3: Define and explain bond energies and their significance in chemical systems. LO4: Determine molecular geometry using bond pairs and lone pairs of electrons (VSEPR principles) and predict overall molecular polarity. LO5: Describe the nature of ionic bonding and the general characteristics of ionic compounds. LO6: Calculate formal charges and determine lattice energies for various chemical species. LO7: Evaluate the stability and solubility of ionic solids, as well as the partial ionic character inherent in covalent bonds.		

Month	Practical/Labs Scheduled Date	No. of Practical /Labs planned	List of Experiments	Reference books
	29-06-2026	1 (Batch II)	Preparation of 0.1N HCl and standardization with anhydrous Na ₂ CO ₃ /Borax.	[1-2]
July	06-07-2026	1 (Batch II)	Estimation of the amount of calcium in the given calcium chloride solution (EDTA method).	[1-2]
	13-07-2026	1 (Batch II)	Determination of the strength of sodium thiosulphate using standard iodine solution.	[1-2]
	20-07-2026	1 (Batch II)	Determination of the percentage composition of the mixture of NH ₄ Cl and BaSO ₄ .	[1-2]
	27-07-2026	1 (Batch II)	Estimation of Fe as Fe ₂ O ₃ from the given solution of ferrous ammonium sulphate.	[1-2]
	03-08-2026	1 (Batch II)	Preparation of Fe(III) Oxalate.	[1-2]
August	10-08-2026	1 (Batch II)	Preparation of Zn(II) Oxalate.	[1-2]
	17-08-2026	1 (Batch II)	Indexing and determination of lattice parameters of Simple cubic, FCC and BCC crystal systems.	[1-2]
	24-08-2026	1 (Batch II)	Indexing and determination of lattice parameters of Simple cubic, FCC and BCC crystal systems	[1-2]
	31-09-2026	1 (Batch II)	Indexing and determination of lattice parameters of Simple cubic, FCC and BCC crystal systems	[1-2]
September	07-09-2026	1 (Batch II)	To determine the partition coefficient of iodine between 1,2 dichloroethane and water	[1-2]

	21-09-2026	1 (Batch II)	To determine the molecular condition of benzoic acid by distribution method	[1-2]
	28-09-2026	1 (Batch II)	To draw the phase diagram of binary system; Diphenylamine and α -Naphthol	[1-2]
	05-10-2026	1 (Batch II)	Determination of molal boiling point elevation constant of NaCl in water system	[1-2]
October	12-10-2026	1 (Batch II)	Determination of molal freezing point depression constant of NaCl and water system	[1-2]

References:

[1] J. Basset, Vogels textbook of quantitative inorganic analysis.

[2] G. Svehla, Vogels qualitative inorganic chemistry, Pearson education.

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