

Lecture Plan		
Name of the college: Government College of Arts, Science and Commerce, Sanquelim- Goa		
Name of Faculty: Ankita M. Vernekar	Subject: Chemistry	
Paper code: CHC-200	Program: SYBSc	Division: A
Academic year: 2026 - 2027	Semester: III	Total Lectures: 30
Course Objectives: To develop a fundamental understanding of periodic properties, chemical bonding, solid-state chemistry, phase equilibria, colligative properties, and distribution law, and their applications in explaining chemical behavior and solving numerical problems.		
Expected Course Outcome: 1. Explain periodic classification of elements and interpret trends in their physical and chemical properties. 2. Apply theories of chemical bonding to predict molecular structure, geometry, stability, and bonding characteristics. 3. Analyze crystal structures and solid-state properties using principles of crystallography and X-ray diffraction. 4. Solve problems related to phase equilibria, colligative properties, and distribution law and interpret their practical applications.		
Student Learning Outcome: 1. Explain periodic classification of elements and interpret trends in their physical and chemical properties. 2. Apply theories of chemical bonding to predict molecular structure, geometry, stability, and bonding characteristics. 3. Analyze crystal structures and solid-state properties using principles of crystallography and X-ray diffraction. 4. Solve problems related to phase equilibria, colligative properties, and distribution law and interpret their practical applications.		

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June	19/06/2026	27/06/2026	1	Phases, components and degrees of freedom of a system, criteria of phase equilibrium.	Define and identify phases, component and Degree of freedom	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
July	29/06/2026	04/07/2026	2	Phase diagrams of one-component systems (water, sulphur and CO ₂)	Study phase diagram	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
July	06/07/2026	11/07/2026	2	two component systems involving eutectics, congruent and incongruent melting points (Zn-Mg, Ag-Pb, NaCl- H ₂ O).	Study phase diagram	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
July	13/07/2026	18/07/2026	2	two component systems involving eutectics, congruent and incongruent melting points (Zn-Mg, Ag-Pb, NaCl- H ₂ O).	Study phase diagram	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
July	20/07/2026	25/07/2026	2	Introduction to Raoult's law. Colligative properties- Lowering of vapour pressure,	Understand the different colligative properties.	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan

July/ August	27/07/2026	01/08/2026	2	depression in freezing point, elevation in boiling point. Osmosis and osmotic pressure.		Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
August	03/08/2026	08/08/2026	2	Experimental methods and determination of molecular weight.	Explain method to determine molecular weight through colligative property	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
August	10/08/2026	15/08/2026	2	Nernst Distribution Law – Statement. Distribution constant, factors affecting distribution constant, validity of distribution law, modification of distribution law when molecules undergo a) association b) dissociation.	Explain and solve problems on Nernst distribution law	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
August	17/08/2026	22/08/2026	2	Application of distribution law - solvent extraction, determination of association, dissociation in one solvent or both the solvent. (Numericals are expected)	Give application of Nernst distribution law	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition. 2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
August	24/08/2026	29/08/2026		Forms of solids, symmetry elements, unit cells, crystal systems, Bravais lattice.	Understand crystal systems	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition.

September	31/09/2026	05/09/2026	2	Laws of crystallography - Law of constancy of interfacial angles, Law of rational indices.	State laws of crystallography	Power point presentation/ Smart board	2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
September	07/09/2026	12/09/2026		Miller indices, X-Ray diffraction by crystals, Bragg's law.	Find miller indices	Power point presentation/ Smart board	1. J.N. Gurtu, Physical Chemistry Vol-III, A pragati edition.
September	14/09/2026	19/09/2026	CHATURTHI BREAK				
September	21/09/2026	26/09/2026	2	Determination of lattice parameters using powder method. Structures of NaCl, KCl and CsCl (qualitative treatment only).	Explain structure of KCl and NaCl	Power point presentation/ Smart board	2. N. B. Laxmeshwar, S. M. Malushte, A. S. Mulye, V. N. Kulkarni, Concepts of Physical Chemistry, Chetana Prakashan
September/ October	28/09/2026	03/10/2026	2	The Origin of the periodic table, Mendeleev's Periodic table, Modern/Long form of Periodic table and Periodic classification of elements into s, p, d, and f-block	Explain the different periodic table	Power point presentation/ Smart board	Puri, Sharma and Kalia, Principles of Inorganic Chemistry, 33 rd Edition, Vishal Publishing Co. (2018).
October	05/10/2026	10/10/2026	2	Periodicity, and magic numbers. Valence Electronic configurations. Periodic properties of the elements and their trends: Atomic radii, van der Waal's radii, Ionic radii and Covalent radii, shielding or screening effect, Effective nuclear charge, Slater rules.	Explain periodic trend	Power point presentation/ Smart board	Puri, Sharma and Kalia, Principles of Inorganic Chemistry, 33 rd Edition, Vishal Publishing Co. (2018).

October	12/10/2026	17/10/2026	2	Ionization Energy, Successive ionization energies and factors affecting ionization energy. Electron Affinity. Electronegativity: Pauling's and Allred-Rochow's scale.	Solve numericals on electronegativity and ionisation energy	Power point presentation/ Smart board	Puri, Sharma and Kalia, Principles of Inorganic Chemistry, 33 rd Edition, Vishal Publishing Co. (2018).
October	21/10/2024	21/10/2024	2	Calculation of electronegativity (Pauling's Method), Factors affecting electronegativity, applications of electronegativity	Explain factors affecting electronegativity	Power point presentation/ Smart board	Puri, Sharma and Kalia, Principles of Inorganic Chemistry, 33 rd Edition, Vishal Publishing Co. (2018).

Assessment Rubrics

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Practical	-
Project	-
Semester End Exam	45