

Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa		
Name of Faculty: Dr. Dattaprasad D Narulkar	Subject: Chemistry	
Paper code: CHC-112(Concepts in Chemistry)	Program/Course: F.Y. B.Sc. (minor)	Division: -
Academic year: 2026 - 2027	Semester: I	Total Lectures: 30 (Theory)
Course Objectives: 1. To outline different theories of the periodic table and classification of elements and trends in the periodic table. 2. To explain different acid-base theories 3. To discuss thermodynamic aspects and solution chemistry. 4. To clarify basic concepts in organic chemistry like nomenclature, types of intermediates and reactions, use of organic compounds.		
Course Learning Outcome: 1. List and recall key terms in organic chemistry, thermodynamics, and solution concentrations; classify elements and outline acid-base theories. 2. Explain thermodynamic concepts, solution laws, organic compound classification, IUPAC rules, aromaticity, and periodic trends.		

3. Apply thermodynamic concepts, concentration laws, acid-base principle, periodic trends, IUPAC and predict equilibrium changes.
4. Analyse and evaluate thermodynamic relationships, equilibrium factors, acid-base theories, periodic trends, and organic reaction mechanisms.

Month	Lectures From	Lectures To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/Assignment	ICT Tools	Reference books
June	22/06/2026	27/06/2026	02	Introduction to the Periodic Table Development of the periodic table- Dobereiner's Triads, Newland's Law of Octaves		Smart board/PPT	Ref 1-4
June-July	29/06/2026	04/07/2026	02	Modern periodic table, (Theories and limitations of Mendeleev's periodic table and Modern periodic table).		Smart board/PPT	Ref 1-4
July	06/07/2026	11/07/2026	02	(Theories and limitations of Mendeleev's periodic table and Modern periodic table), Classification of the elements into s,p,d and f -block elements based on electronic configuration (Continued)		Smart board/PPT	Ref 1-4
July	13/07/2026	18/07/2026	02	Classification of the elements into s,p,d and f -block elements on the basis of electronic configuration (Continued)		Smart board/PPT	Ref 1-4
July	20/07/2026	25/07/2026	02	Trends in the periodic table (atomic and ionic size)	Assignment on periodic table	Smart board/PPT	Ref 1-4

July-August	27/07/2026	01/08/2026	02	Acid- Base Theories: Arrhenius Concept, Bronsted Theory		Smart board/PPT	Ref 1-4
August	03/08/2026	08/08/2026	02	Bronsted Theory, The Lux – Flood Solvent Systems,		Smart board/PPT	Ref 1-4
August	10/08/2026	15/08/2026	02	Lewis Concept of Acids and Bases. Thermodynamics I: Definition of thermodynamic terms, system, surroundings etc.	Examples of acids and bases and categorisation based on various theories	Smart board/PPT	Ref 1-4
August	17/08/2026	22/08/2026	02	Types of thermodynamic systems and thermodynamic processes. Intensive and extensive properties		Smart board/PPT	Ref 5-6
August	24/08/2026	29/09/2026	02	Concept of heat and work, first law of thermodynamics, definition of internal energy and enthalpy.		Smart board/PPT	Ref 5-6
August-September	31/09/2026	05/09/2026	02	Heat capacity – heat capacities at constant volume and at constant pressure and their relationship,		Smart board/PPT	Ref 5-6
September	07/09/2026	12/09/2026	02	calculation of w, q, dU & dH for the expansion of ideal gases under isothermal and reversible conditions.		Smart board/PPT	Ref 5-6
September	14/09/2026	19/09/2026		Ganesh Chaturthi break			

September	21/09/2026	26/09/2026	02	Solutions of liquids in liquids, Raoult's law and deviation from Raoult's Law		Smart board/PPT	Ref 5-6
September-October	28/09/2026	03/10/2026	02	(Ways of expressing concentration: Molarity, Normality, Molality Mole fraction, parts per million)		Smart board/PPT	Ref 5-6
October	05/10/2026	10/10/2026	02	Solutions of gases in Liquids: Factors influencing the solubility of gases. Henry's law. Numerical problems	Numerical problems based on concentrations	Smart board/PPT	Ref 5-6
October	12/10/2026	14/10/2026	02	Revision		Smart board/PPT	-

Reference Books:

1. J. D. Lee, *Concise Inorganic Chemistry*, 5th Edn. Wiley India. 2003.
2. P. W. Atkins, T. L. Overton, J. P. Rourke, M. T. Weller & F. A. Armstrong, *Shriver & Atkins' Inorganic Chemistry*, 5th Edn.; Oxford University Press. 2010.
3. F. A. Cotton, G. Wilkinson and P. L. Gaus, *Basic Inorganic Chemistry*. 3rd Edn. Wiley India. 2007.
4. B. R. Puri, L. R. Sharma and K. C. Kalia, *Principles of Inorganic Chemistry*, 33rd Edn, Vishal Publishing Co. 2020.
5. A. Bahl, B.S Bahl and G.D. Tuli, *Essentials of Physical Chemistry*, S. Chand Publication. 2009.
6. Puri, Sharma and Pathania, *Principles of Physical Chemistry*. 47th edition. 2020..

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
ISA 3	7.5
Practicals	25
Semester End Exam	60

Total 100

*Best two ISA will be considered