Lecture Plan

Name of the college: Govt. college of Arts Sci. and Com. Sanquelim

Name of Faculty: DR. SAGAR N. PATIL	**Subject:**Chemistry

Paper code: CHC-100 Fundamentals of Chemistry	**Program: FY BSc**	**Division: A**

Academic year: 2025- 2026	**Semester: II**	**Total Lectures: 30**

Course Objectives

To acquire knowledge about the fundamental concepts of organic, inorganic and physical chemistry

2. Explain properties and applications of liquid and gases.

3. Elucidate the atomic structure based on Quantum theory.

4. Understand basic concept of organic chemistry, preparation and reactions of alkanes,alkenes and alkynes

Expected Course Outcome:

Students attain understanding about the properties and applications of liquid and concept of organic chemistry, preparation and reactions of alkanes,alkenes and alkynes etc.

Student Learning Outcome: Students are eposed to different properties, theories, concept of liquid and gases and with detail understanding of preparation and reactions of alkanes,alkenes and alkynes.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
December 2025	1st	6th	02	**Fundamentals of Physical Chemistry** **Gaseous state** Postulates of Kinetic Theory of gases and deviation from ideal behaviour, Vander Waal's equation of state. .	See videos on Rutherfords expt.	Smart board, PPT and chalk and black board	Lee, J.D. *Concise Inorganic Chemistry* ELBS, 1991. 2. Cotton, F.A., Wilkinson, G. & Gaus, P.L. *Basic Inorganic Chemistry*, 3rd ed., Wiley. 3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. *Concepts and Models in Inorganic Chemistry*, John Wiley & Sons. 4. Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. *Inorganic Chemistry: Principles of Structure and Reactivity*, Pearson Education India, 2006.
	8th	13th	02	**Liquid State** Surface Tension, Viscosity			
Jan 26	5th	10th	03	**Fundamentals of Physical Chemistry** **Gaseous state** Postulates of Kinetic Theory of gases and deviation from ideal behaviour, Vander Waal's equation of state. Critical phenomenon; PV isotherms of real gases, continuity of states, the isotherms of Vander Waal's equation relation between critical constants and Vander Waal's constants. Law of corresponding states, reduced equation of state. Molecular velocities: root mean square, average and most probable velocities, Qualitative discussion of Maxwell's distribution of molecular velocities, collision number, mean free path and collision diameter. Numerical problems. **Liquid State** Surface Tension, Units of Surface Tension, Determination of Surface Tension by Capillary Rise Method and stalagmometer method. Viscosity, Units of Viscosity, Poiseuille equation, Measurement of Viscosity by Ostwald Method,			
	12th	17th	02				
	19th	24th	02				

				Effect of Temperature on Viscosity of a Liquid.		
	27th	31st	02	Numerical problems.		
Feb 26	2nd	7th	02	**Fundamentals of Organic Chemistry** **Basic Organic Chemistry** Curved arrow notation, drawing electron movement with arrows, half and double headed arrows, in organic reaction mechanisms. Physical Effects, Electronic Displacements: Inductive Effect, Mesomeric effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pKa values. Aromaticity: Benzenoids and Hückel's rule.		
	9th	14th	02			
	16th	21st	02			
	23rd	28th	02			
March 26	2nd	7th	02	**Aliphatic Hydrocarbons: Functional group approach for the following reactions** (Preparations & reactions) to be studied in context to their structure Alkanes: Preparation: Wurtz reaction, Kolbe's synthesis, Reactions: Free radical Substitution: Halogenation. Alkenes: Preparation: Elimination reactions: Dehydration of alcohols and dehydrohalogenation of alkyl halides Reactions: Addition of HX (Markownikoff's and anti-Markownikoff's addition) Alkynes: Preparation: Acetylene from		
	9th	14th	02			
	16th	21st	02			
	23rd	28th	02			

				CaC2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. Reactions: formation of metal acetylides, addition of HX and bromine.			
	30th	31st	01	Problems, revision, paper solving			

*** Assessment Rubrics**

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