# First Year - Second Semester

## Paper 202101 Physical Chemistry 2 Credits, 50 Marks(30 Hrs)

3 Hrs / Week

I. Gaseous State: 06 Hrs

Postulates of kinetic theory of gases, kinetic gas equation, Deduction of Gas Laws : Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behaviour, van der Waals equation of state. Critical Phenomena : PV isotherms of real gases.

II.Chemicals Kinetics and Catalysis: 12 Hrs

Chemical Kinetics and its scope, rate of reaction, factors influencing the rate of reaction - concentration, temperature, pressure, solvent, light, catalyst concentration dependence of rates. Derivation of rate law and characteristics of simple chemical reactions - zero order, first order, second order, Pseudo first order, half life.Effect of temperature on rate of reaction.Arrhenius equation, concept of activation energy.Catalysis : Definition, types, and characteristics of catalysis, homogeneous, heterogeneous catalysis - Enzyme catalysis and its application.

III.Liquid State: 03 Hrs

Intermolecular forces, structure of liquids (a qualitative description). Difference between solids, liquids and gases. Liquid Crystals: Classification, structure of nematic and cholestric phases.

IV. Solid State : 06 Hrs

Types of solids, Amorphous, crystalline and difference between them, Miller Indices. Laws of crystallography - (i) Law of constancy of interfacial angels (ii)Law of rationality of indices (iii) Law of symmetry. Symmetry elements in crystals.X-ray diffraction by crystals.Derivation of Bragg equation.

V.Colloidal State : 03 Hrs

Definition of colloids, classification of colloids.

Solids in liquids (sols) : properties - kinetic, optical and electrical; stability of colloids, protective action. Hardy - Schulze Law. Liquids in liquids (emulsions) : types of emulsions, preparation. Liquids in Solids (gels) : classification, general applications of colloids.