Curriculum Plan of Dr. Kapil Mohan Saini
(Even Semester 2020-2021)
Semester-II

Name of Paper & Code: CHEMISTRY - C IV: PHYSICAL CHEMISTRY - II, Chemical Thermodynamics and its Applications (2 Periods Per Week)

Contents	Allocations of Lectures	Month wise Schedule to be followed	Tutorials/ Assignment/ Presentation
Chemical Thermodynamics: Intensive and extensive variables; state and path functions; isolated, closed and open systems. Mathematical treatment - Exact and inexact differential, Partial derivatives, Euler's reciprocity rule, cyclic rule.	6	1st Week of April – 3rd week of April	- Syllabus Overview - Reference Books - Problem Solving
Solutions and Colligative Properties: Dilute solutions; lowering of vapour pressure, Raoult's law, Henry's law. Thermodynamic basis of the colligative properties - lowering of vapour pressure, elevation of Boiling Point, Depression of Freezing point and Osmotic pressure and derivation of expressions for these using chemical potential. Application of colligative properties in calculating molar masses of normal, dissociated and associated solutes in solutions. Concept of activity and activity coefficients.	10	4th Week of April – 3rd Week of May	- Related Problems, Class Test
Systems of Variable Composition: Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, Change in thermodynamic functions on mixing of ideal gases. **Chemical Equilibrium:** Criteria of thermodynamic equilibrium, degree of advancement of reaction, Chemical equilibria in ideal gases, Thermodynamic derivation of relation between Gibbs free energy of a reaction and reaction quotient, Equilibrium constants and their dependence on temperature, pressure and concentration, Le Chatelier's Principle (Quantitative treatment), Free energy of mixing and spontaneity, Equilibrium between ideal gases and a pure condensed phase.	10	4th Week of May -4th Week of June	-Home - Register Overview, -Related Problems, -Previous Year Qsn Papers discussion, -Assignment,
Third Law: Statement of third law, unattainability of absolute zero, calculation of absolute entropy of molecules, concept of residual entropy, calculation of absolute entropy of solid, liquid and gases.	4	1st Week of July to 3rd Week of July	Home Register Overview, Student' s Difficulties, Class Test,