Teaching Plan 2024

B.Sc. Chemistry (H), II Sem

Subject: Physical Chemistry (DSC)

Teacher: **Dr. Rakesh Pant**

Week	Dates From – To	Topic
1.	18/01/2024 - 26/01/2024	A brief overview of the syllabus, **Unit I:** Basic concepts of chemical thermodynamics; Intensive and extensive variables, state and path functions, Types of systems, Exact and inexact differentials, Partial derivatives,
2.	29/01/2024 - 02/02/2024	**Unit I:** Euler's reciprocity relation, Cyclic rule **Unit II**: First Law and Thermochemistry Work, heat, work, Internal Energy, First law, Enthalpy, relation between heat capacities,
3.	05/02/2024 - 09/02/2024	Joule Thompson Porous Plug experiment, Nature of Joule Thompson coefficient,
4.	12/01/2024 - 16/01/2024	calculations of Q, W, ΔU, ΔH for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions
5.	19/02/2024 - 23/02/2024	Enthalpy of reactions; standard states; enthalpy of neutralization, enthalpy of hydration, Enthalpy of formation and enthalpy of combustion and its applications, bond dissociation energy and bond enthalpy,
6.	26/02/2024- 01/03/2024	effect of temperature (Kirchoff's equations) on enthalpy of reactions. Revision and practice problems on First law
7.	04/03/2024 - 08/03/2024	**Unit III:** Second Law Concept of entropy; statement of the second law of thermodynamics, Carnot cycle.
8.	11/03/2024 - 15/03/2024	Calculation of entropy change for reversible and irreversible processes (for ideal gases)
9.	18/03/2024 - 22/03/2024	Free energy functions; Gibbs and Helmholtz energy
10.	24/03/2024 - 31/03/2024	Mid-semester break
11.	01/04/2024 - 05/04/2024	variation of S, G, A with T, V, P; Free energy change and spontaneity (for ideal gases).
12.	08/04/2024 - 12/03/2024	Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature;
13.	15/04/2024 - 19/04/2024	Assignment for Units I to II; Gibbs-Helmholtz equation; Maxwell relations; thermodynamic equation of state.

14.	22/04/2024 - 26/04/2024	Test for units I to II; **Unit IV**: 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.
15.	29/04/2024 - 03/05/2024	Revision of Second law of thermodynamics; **Unit V:** Systems of Variable Composition;Partial molar quantities,
16.	06/05/2024 - 10/05/2024	dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, Change in thermodynamic functions on mixing of ideal gases.