**CURRICULUM PLAN 2024-25**

Odd Semester: I, III, V

**Dr. Savita Sharma**

Department of Physics

**DSC Paper: Heat & Thermodynamics**

**B.Sc. Physical Sciences – II year, III Sem**

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| Content | Allocation of Lectures | Month-wise Schedule followed | Tutorial/assignment/presentation etc |
| **Heat & Thermodynamics** |  |
| **Unit – I - Laws of Thermodynamics:**Fundamental basics of Thermodynamic system and variables, Zeroth Law ofThermodynamics and temperature, First law and internal energy, various thermodynamicalprocesses, Applications of First Law: general relation between CP and CV, work done duringvarious processes, Compressibility and Expansion Coefficient, reversible and irreversibleprocesses, Second law: Kelvin-Planck and Clausius statements, Carnot engine, Carnot cycleand theorem, basic concept of Entropy, Entropy changes in reversible and irreversibleprocesses, Clausius inequality, Entropy-temperature diagrams. | 10 | 2-Aug to 28-Aug | Syllabus OverviewReference booksDerivations and Numericals |
| **Unit – II - Thermodynamic Potentials and Maxwell’s Relations:**Basic concept of Thermodynamic Potentials, Internal Energy, Enthalpy, Helmholtz FreeEnergy, Gibb’s Free Energy, derivation of Maxwell’s Thermodynamic Relations and theirapplications in Clausius Clapeyron Equation, value of CP – Cv, TdS Equations, Energyequations for ideal gases, evaluation of CP /Cv | 5 | 30-Aug to 11-Sept | Derivations andNumericalsDiscussion ofImportant questions |
| **Unit – III - Kinetic Theory of Gases and Molecular Collisions:**Maxwell-Boltzmann Law of Distribution of Velocities in an ideal gas and its experimentalverification, Mean, Root Mean Square and Most Probable Speeds, Mean Free Path (Zerothorder), Transport Phenomena in ideal gases: Viscosity, Thermal Conductivity and Diffusion(for vertical case) | 6 | 12-Sept to 6-Oct | Derivations andNumericalsDiscussion ofImportant questionsHome Register Checking |
| **Unit – IV - Theory of Radiation:**Blackbody radiation, Spectral distribution, Derivation of Planck’s law, Deduction of Wien’slaw, Rayleigh-Jeans Law, Stefan Boltzmann Law and Wien’s displacement law fromPlanck’s law | 5 | 7-Oct to 31-October | Derivations andNumericals |
| **Unit – V - Statistical Mechanics:**Macrostate and Microstate, phase space, Entropy and thermodynamic probability, Maxwell-Boltzmann law, qualitative description of Quantum statistics – Bose Einstein and FermiDirac, comparison of three statistics | 04 |  01-November to 27-November | Derivations andNumericals |