VEER NARMAD SOUTH GUJARAT UNIVERSITY

Syllabus for B. Sc. Semester V

Subject: Physics (PHY-5009)

Paper – IX

[2 credit course- 2 hours per week]

Unit – I **Statistical Mechanics** **Duration: 15 hrs**

Macroscopic and microscopic states:

Macroscopic states (4.1), microscopic states (4.2), phase space (4.3), μ space (4.4), γ space (4.5), postulates of equal apriory probability (4.6), ergodic hypothesis (4.7), density distribution in phase space (4.8), Liouville's theorem (4.9), principle of conservation of density in phase and principle of extension in phase (4.10), condition of statistical equilibrium (4.11)

Statistical Ensemble:

Micro canonical ensemble (5.1), canonical ensemble (5.2), alternative method for the derivation of canonical distribution (5.3), mean value and fluctuation (5.4), grand canonical ensemble (5.5), the alternative method for the derivation of grand canonical ensemble distribution (5.6), fluctuations in the number of particles of a system in a grand canonical ensemble (5.7)

Text book: Statistical Mechanics by B B Laud, New Age International

Unit – II **Relativity** **Duration: 15 hrs**

Galilean transformation (10.1), Electromagnetism and Galilean transformation (10.2), Michelson- Morley's experiment (10.3), the interferometer (10.4), The experiment (10.5), The postulate of special theory of relativity (10.6), Lorentz transformation (10.7), velocity transformation (10.8), length contraction (10.9), time dilation (10.10), simultaneity, Mass in relativity, Mass and energy (10.11)

Text book: Classical Mechanics by G Arul Dhas, PHI of India pvt ltd.

Note: Illustrative problems on all the relevant topics should be covered.

REFRENCE BOOKS:

1. Statistical mechanics by R K Pathariya, Butterworth-Heinemann
2. Statistical mechanics by K Huang, Wiley
3. Fundamentals of statistical and thermal physics by F reif, McGraw Hill
4. Introduction to special relativity by R Resnik, Wiley
5. Concepts of Modern physics by A Beiser, Tata McGraw Hill
6. Modern physics by K Krane, Wiley India pvt ltd.