VEER NARMAD SOUTH GUJARAT UNIVERSITY

Syllabus for B. Sc. Semester VI

Subject: Physics (PHY-6009)

Paper – IX

[2 credit course- 2 hours per week]

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

Some applications of Statistical Mechanics:

Thermodynamics (6.3), Statistical interpretation of the basic thermodynamical variables (6.4), physical interpretation of α (6.5), chemical potential in the equilibrium state (6.6), thermodynamic functions in terms of grand partition function (6.7), ideal gas (6.8), Gibb's paradox (6.9), the equipartition theorem (6.10), the statistics of Para magnetism and Curies law (6.11), (classical approach) thermal disorder in crystal lattice (6.12)

MB/BE/FD statistics:

Symmetry of wave functions (8.1), the Boltzmann limit of Boson and Fermion gases (8.2), evaluation of partition function (8.3)

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

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

Relativistic Lagrangian of a particle (10.12), Relativistic Hamiltonian of a particle (10.13), Space-time diagram (10.14), Geometrical interpretation of Lorentz transformation (10.15), Principle of Covariance (10.16), Four vectors in Mechanics (10.17), Position four-Vectors, Four-Velocity, Momentum Four-Vector, Four-Force, Four-Acceleration, Charge current Four-Vector (10.18), Invariance of Maxwell's equations, Maxwell's equations, Vector and Scalar potentials, Gauge transformations, Four-Vector potentials.

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

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

REFRENCE BOOKS:

7. Statistical mechanics by R K Pathariya, Butterworth-Heinemann
8. Statistical mechanics by K Huang, Wiley
9. Fundamentals of statistical and thermal physics by F reif, McGraw Hill
10. Introduction to special relativity by R Resnik, Wiley
11. Concepts of Modern physics by A Beiser, Tata McGraw Hill
1. Modern physics by K Krane, Wiley India pvt ltd.