VEER NARMAD SOUTH GUJARAT UNIVERSITY

Syllabus for B. Sc. Semester V

Subject: Physics (PHY-5007)

Paper – VII

[2 credit course- 2 hours per week]

Unit – I **Electromagnetism** **Duration: 15 hrs**

Dielectrics:

The polarization density ρ (5.1), polarization charge density (5.2), the relation $\vec{D} = \in_o \vec{E} + \vec{P}$ (5.3), Gauss's law in the presence of a dielectric; Boundary conditions on D and E (5.4)

Faraday's law of electromagnetic induction:

The law (9.1), motional emf (9.3), mutual inductance (9.4), self-inductance (9.5)

Text book: Electricity and magnetism by Mahajan and Rangwala,
Tata McGraw-Hill publishing company ltd. (26^{th} reprint)

Plasma:

Quasi-neutrality in plasma (12.1), plasma as a conducting fluid-fluid magneto-hydrodynamics (12.3), magnetic confinement-Pinch effect (12.4)

Text book: Electromagnetism by B B Laud, New Age International

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

Fiber optics:

Introduction (27.1), total internal reflection (27.3), the optical fiber (27.4), why glass fibers? (27.5), the numerical aperture (27.7), attenuation in optical fibers (27.8)

Text book: Optics by Ajoy Ghatak, Tata-McGraw-Hill publishing company ltd. (4^{th} edition)

Inetrferometry:

Haidinger's fringes (8.29), Michelson interferometer (8.32), types of fringes (8.33), applications of Michelson interferometer (8.35), determination of wavelength of monochromatic light (8.36), determination of difference in wavelength between two neighboring spectral lines (8.37), determination of the refractive index of gases (8.39), Fabry-Perot interferometer (8.45)

Text book: A text book of Optics by Subrahmanyam and Brij Lal, S Chand & Company Ltd, (22^{nd} edition)

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

REFRENCE BOOKS:

1. Introduction to Electrodynamics by D J Griffiths, PHI Learning
2. Electricity & magnetism by Sehgal, Chopra & Sehgal, S Chand & Sons
3. Electromagnetism by Grant & Philips**,** John Wiley & Sons Inc
4. Fundamental of magnetism & Electricity by D N Vasudeva, S Chand & Co
5. Fundamentals of optics by Jenkins & White, Tata McGraw Hill Education