VEER NARMAD SOUTH GUJARAT UNIVERSITY

Syllabus for B. Sc. Semester VI

Subject: Physics (PHY-6007)

Paper – VII

[2 credit course- 2 hours per week]

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

Magnetism:

Three types of magnetic substances (11.1), magnetization M (11.2), the equation $B = \mu_0 M + \mu_0 H$ (11.3), the bohr magneton (11.4), hysteresis, the $B - H$curve (11.5)

Maxwell's equations:

The displacement current (12.1), Maxwell's equations (12.2), Poynting vector (12.3), the wave equation (12.4), plane electromagnetic waves (12.5), energy considerations (12.6)

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

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

Coherence:

Introduction (17.1), the line width (17.2), the spatial coherence (17.3), Michelson-Steller interferometer (17.4)

Lasers:

Introduction (26.1), spontaneous and stimulated emission (26.1.1), main components of the laser (26.1.2), understanding optical amplification: the EDFA (26.1.3), the Ruby laser (26.3), spiking in Ruby laser (26.3.1), the He-Ne laser (26.4), Einstein coefficients and optical amplification (26.6)

Holography:

Introduction (21.1), theory (21.2), requirements (21.3), some applications (21.4)

Text book: Optics by Ajoy Ghatak,
Tata-McGraw Hill publishing company ltd. (4^{th} 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
6. A text book of Optics by Subrahmanyam & Brij Lal