VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.Sc. (Biotechnology) (Five Years Integrated)

Semester - I

IBT: 102
Course Title: Physics

Unit-I (7 hrs.)
Optic interference: Coherence and coherent sources, interference by division of wave front interference by division of amplitude. Interferometer, Fabry Perot interferometer.

Unit-II (7 hrs.)
Diffraction: Types-Fresnel and Frannhotter, Fraunhofer diffraction (single, double and circular aperture slit. Resolving power of optical instruments. Resolving power and dispersive.

Unit-III (7 hrs.)
Polarization: Types of polarization, Brewster's law elliptically and circular polarized light, Malu's law, Laurent half-shade polarimeter.

Unit-IV (7 hrs.)
Lasers: Introduction, Types of Lasers, He-Ne laser, Ruby laser, semi-conductor laser holography-theory and applications. Basic principle and operation of lasers.

Unit-V (7 hrs.)
Fiber optics: Introduction to optical fiber, types and their characteristics, step and graded index fibers. Principle of fiber optic communication. Fiber optical communication network and its advantage.

Unit-VI (7 hrs.)
Nature of light and matter: Particle nature of radiation-The Photoelectric effect, Compton effect, X-ray and X-ray diffraction-Bragg's law.
The origin of quantum theory-planck's hypothesis. Basic postulates of quantum mechanics – the wave function
The electro magnetic spectrum, sources of light. Sources of light, emission and absorption spectra. Brief introduction to optical, magnetic resonance, spectroscopy.

Reference books :

1. Modern Physics – A. Beiser
2. Modern physics – Hallday & Resvik
3. Introduction to Physical optics – Jenking & White
4. Optics – A.K. Ghetak.