

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Physics)
Semester: III
Syllabus with effect from: June-2012

Paper Code: US03CPHY01	Total Credit: 3
Title Of Paper: Optics	

Unit	Description in detail	Weighting (%)
I	<p>Geometrical Optics Lens Systems: Introduction to lens systems, Cardinal points of lens systems, Construction of image using cardinal points, Newton's formula, Combination of two thin lenses, Related Numericals Lens Aberrations: Types of monochromatic aberration and their reduction- Spherical aberration, Coma, Astigmatism, Curvature of field, Distortion, Chromatic aberration in a lens Eyepieces: Importance of an objective lens, Huygens eyepiece, Ramsden eyepiece</p>	
II	<p>Interference and Diffraction Interference: Techniques for obtaining interference, Interference by division of wavefront- Fresnel's biprism, Lloyd's single mirror, Interference by division of amplitude- Newton's ring, Multiple beam interferometry- Multiple reflections from a plane parallel film, Fabry-Perot interferometer and Etalon Diffraction: Fresnel's diffraction, Diffraction due to a narrow wire, Cornu's spiral, Fraunhofer's diffraction, Fraunhofer's diffraction at double slit and its analytical treatment, Fraunhofer's diffraction at N slits, Related Numericals</p>	
III	<p>Polarization Introduction, Types of polarization- plane, circular, elliptical, Production of linearly polarized light, Polarizer and analyzer, Anisotropic crystals, Calcite crystal, Huygens' explanation of double refraction, Superposition of waves linearly polarized at right angles, Types of polarized light, LCDs</p>	
IV	<p>Fiber Optics Introduction, Optical fiber, Total internal reflection, Propagation of light through an optical fiber, Fractional refractive index change, Numerical aperture, Modes of propagation, Classification of optical fibers, The three types of fibers, Materials, Characteristics of the fibers, Merits of optical fibers</p>	

Basic Text & Reference Books:-

- A Textbook of Optics
Subrahmanyam, Brij lal and Avadhnlulu
S Chand Publication
- Optics
Ajoy Ghatak, McGraw-Hill Publishing Co. Ltd.
- Textbook of light
D N Vasudev
Atma Ram and Sons, New Delhi
- Fundamental of Optics
F A Jenkin and H E White
Tata McGraw Hill Book Co. Ltd.

