Physical Optics BVOCOP-103

**Unit-1:**

Dual nature of light- Simple harmonic motion- differential; Simple harmonic waves- mathematical representation; Super position of simple harmonic waves.

**Unit-2:**

**HUYGENS’** Principle – Laws of reflection and refraction at plane and spherical surfaces. Wave velocity group velocity; determination of velocity of light (any one method.)

**Unit-3:**

**Interference:** Coherence; path and phase difference; Theory of interference fringes intensity distribution infringes; Young’s double slit experiment- Fresnels’ biprism, Lloyds’ mirror experiments; visibility of fringes. Interference in thin films due to reflected and transmuted light- Interference in wedge Shaped films; Newton’s ring experiment ; Color of thin films; Thin film antireflection coating and filters.

**Unit-4:**

**Diffraction:** Diffraction by single slit; double slit, multiple slit- grating, circular aperture – amplitude & intensity distribution (final expressions only). Circular aperture- airy pattern, resolution by circular apertures. Diffraction grating- reflection, transmission, amplitude & phase gratings (definitions in brief) Grating dispersion & dispersive power, spectral resolution; zone plates.

**Unit-5:**

**Polarization & Crystal Optics:** Concept of polarization , linear , circular , elliptical polarization (qualitatively), Plane of polarization & vibration, degree of polarization, polarizes, analyzers, Production of polarized light, birefringence, calculate crystal , veal prism, Wallaston prism , retarders - full, half & quarter wave plates, analysis of light of unknown Polarization. Linear Scattering- Raleigh & Mce

**Unit-6:**

Principles of LASERs, Holography – basic principle; simple experimental arrangement, some applications **Textbooks:**

1. Subrahmanyan.N, BrijLal, A textbook of Optics, S.Chand.Co Ltd, New Delhi, India,2003.

2. Pedrotti L. S, Pedrotti Sr. F. L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.

**3. Reference Books:**

1. PedrottiL.S, PedrottiSr.F.L, Optics and Vision, Prentice Hall, New Jersey, USA, 1998.

2. Keating NM. P, Geometric, Physical and Visual Optics, Butterworth- Heinemann, Massachusetts, USA, 2002.

3. Loshin D. S. The Geometric Optics Workbook, Butterworth-Heinemann, Boston, USA, 1991.

4. Schwartz S. H. Geometrical and Visual Optics: A Clinical Introduction, McGraw-Hill, New York, USA, 2002.

5.Tunnacliffe A. H, Hirst J. G, Optics, The association of British Dispensing Opticians, London, U.K., 1990.