PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Electronics & Communication Engineering

LESSON PLAN

Subject Name: - Optics and Wave **Subject Code: - BS-201A**
Year: - 2nd **Semester: - 3rd**

Lecture No	Unit No	Topic	COs Covered
L 1	UNIT-I	**Travelling** waves, Characteristics of waves	CO1
L 2		Mathematical representation of travelling waves	
L 3		General wave equation, Phase velocity, Light source emit wave packets	
L 4		Wave packet and Bandwidth, Group velocity and real light waves	
L 5		Maxwell's equations, Electromagnetic waves and constitutive relations	
L 6		Wave equation for free-space, Uniform plane waves	
L 7		Wave polarization, Energy density, the pointing vector and intensity	
L 8		Radiation pressure and momentum, Light waves at boundaries	
L 9		Wave incident normally on boundary	
L 10		Snell's law and reflection coefficients	
L 11	UNIT-II	**Principle** of Superposition, Conditions for Sustained interference	CO2
L 12		Young's double slit experiment	
L 13		Fresnel's Biprism and its applications	
L 14		Interference due to reflected and transmitted light	CO2
L15		Wedge-shaped thin film	
L16		Newton's rings and its applications	
L 17		Michelson Interferometer and its applications	
L 18	UNIT-III	**Types** of diffraction, Fraunhofer diffraction at a single slit	CO2
L 19		Plane transmission diffraction grating: theory, secondary maxima and secondary minima	

L 20		Width of principal maxima, absent spectra, overlapping of spectral lines	
L 21		Determination of wavelength	
L 22		Dispersive power and resolving power of diffraction grating	
L 23		Polarization of transverse waves, Plane of polarization	
L 24		Nicol Prism, Quarter and half wave plate	
L 25		Laurent 's half shade polarimeter	
L 26		Biquartz polarimeter, Biquartz polarimeter	
L 27	UNIT-IV	**Stimulated** Absorption, Spontaneous and Stimulated Emission	CO3
L 28		Einstein's Coefficients and its derivation	
L 29		Population Inversion, Direct and Indirect pumping	
L 30		Gas lasers (He-Ne, CO_2)	
L 31		Solid state lasers (Ruby)	
L 32		Solid state lasers (Neodymium)	
L 33		Solid state lasers (Semiconductor)	
L 34		Dye laser	
L 35		Characteristics of Laser	
L 36		Applications of Laser	

Text Books:

P.K. Diwan, Applied Physics for Engineers, *Wiley India Pvt. Ltd*., *India*

References:

1. N. Subrahmanyam, B. Lal, M.N. Avadhanulu, A Textbook of Optics, *S. Chand & Company Ltd*., *India.*
2. A. Ghatak, Optics, *McGraw Hill Education (India) Pvt. Ltd., India*.
3. E. Hecht, A.R. Ganesan, Optics, *Pearson India Education Services Pvt. Lt., India.*