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

LESSON PLAN

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

Lecture No	Unit No	Topic	References
L1	UNIT -2	Principle of Superposition	P.K. Diwan, Applied Physics for Engineers, *Wiley India Pvt. Ltd., India*
L2		Conditions for Sustained interference	
L3		Young's double slit experiment	
L4		Division of wave-front: Fresnel's Biprism and its applications	
L5		Division of amplitude: Interference due to reflected and transmitted light	
L6		Wedge-shaped thin film	
L7		Newton's rings and its applications	
L8		Michelson Interferometer and its applications.	
L9	UNIT -3	**Diffraction:** Types of diffraction	P.K. Diwan, Applied Physics for Engineers, *Wiley India Pvt. Ltd., India*
L10		Fraunhofer diffraction at a single slit	
L11		Plane transmission diffraction grating: theory, secondary maxima and secondary minima, width of principal maxima	
L12		absent spectra, overlapping of spectral lines, determination of wavelength	
L13		Dispersive power and resolving power of diffraction grating.	
L14		**Polarization:** Polarization of transverse waves	
L15		Plane of polarization, Polarization by	

		reflection	
L16		Double refraction	
L17		Nicol Prism, Quarter and half wave plate	
L18		Specific Rotation, Laurent ‘s half shade polarimeter,	
L19		Biquartz polarimeter.	
L20	UNIT -4	**Laser:** Stimulated Absorption,	A. Ghatak, Optics, *McGraw Hill Education (India) Pvt. Ltd., India*. E. Hecht, A.R. Ganesan, Optics, *Pearson India Education Services Pvt. Lt., India.*
L21		Spontaneous and Stimulated Emission	
L22		Einstein’s Coefficients and its derivation, Population Inversion	
L23		Direct and Indirect pumping, Pumping schemes	
L24		Main components of Laser, Gas lasers (He-Ne, CO_2)	
L25		Solid state lasers (Ruby, Neodymium, semiconductor), Dye laser,	
L26		Characteristics of Laser, Applications of Laser	
L27		REVISION	
L28		REVISION	
L29	UNIT -1	Travelling waves, Characteristic of Waves	N. Subrahmanyam, B. Lal, M.N. Avadhanulu, A Textbook of Optics, *S. Chand & Company Ltd*., *India*
L30		Mathematical representation of travelling waves	
L31		General wave equation, Phase velocity	
L32		Light source emit wave packets, Wave packet and Bandwidth	
L33		Group velocity and real light waves.	
L34		**Propagation of light waves:** Maxwell’s equations, Electromagnetic waves and	

		constitutive relations	
L35		Wave equation for free-space, Uniform plane waves	
L36		Wave polarization, Energy density,	
L37		the pointing vector and intensity,	
L38		Radiation pressure and momentum	
L39		Light waves at boundaries, Wave incident normally on boundary,.	
L40		Wave incident obliquely on boundary: law of reflection	
L41		Snell's law and reflection coefficients	

Text Book:

Text/Reference Books:

1. P.K. Diwan, Applied Physics for Engineers, *Wiley India Pvt. Ltd*., *India*
2. N. Subrahmanyam, B. Lal, M.N. Avadhanulu, A Textbook of Optics, *S. Chand & Company Ltd*., *India.*

Reference Books:

1. A. Ghatak, Optics, *McGraw Hill Education (India) Pvt. Ltd., India*.
2. E. Hecht, A.R. Ganesan, Optics, *Pearson India Education Services Pvt. Lt., India.*