PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY
PANIPAT
Department of Mechanical Engineering
LESSON PLAN

Subject Name: - Optics & Waves

Year/Semester: 2nd/ 3rd   **Subject Code: - BS-201**

LESSON PLAN

Sr. No.	Lecture No.	Topics To Be Covered	Tentative Date
1	L1	**Unit – II Interference:** Principle of Superposition, Conditions for Sustained interference	
2	L2	Young's double slit experiment	
3	L3	Division of wave-front: Fresnel's Biprism	
4	L4	Applications of Fresnel's Biprism	
5	L5	Division of amplitude: Interference due to reflected and transmitted light	
6	L6	Wedge-shaped thin film	
7	L7	Newton's rings and its applications	
8	L8	Michelson Interferometer and its applications.	
9	L9	**Unit – III Diffraction and Polarisation:** Types of diffraction	
10	L10	Fraunhofer diffraction at a single slit	
11	L11	Plane transmission diffraction grating: theory, secondary maxima and secondary minima	
12	L12	width of principal maxima, absent spectra	
13	L13	overlapping of spectral lines, determination of wavelength	
14	L14	Dispersive power and resolving power of diffraction grating.	
15	L15	Polarization: Polarization of transverse waves, Plane of polarization, Polarization by reflection	

16	L16	Double refraction, Nicol Prism	
17	L17	Quarter and half wave plate	
18	L18	Specific Rotation, Laurent 's half shade polarimeter	
19	L19	Biquartz polarimeter	
20	L20	**Unit – IV Laser:** Stimulated Absorption, Spontaneous and Stimulated Emission	
21	L21	Einstein's Coefficients and its derivation	
22	L22	Population Inversion, Direct and Indirect pumping	
23	L23	Pumping schemes, Main components of Laser	
24	L24	Gas lasers (He-Ne, CO2)	
25	L25	Solid state lasers (Ruby, Neodymium, semiconductor)	
26	L26	CONT...... Solid state lasers (Ruby, Neodymium, semiconductor)	
27	L27	Dye laser, Characteristics of Laser	
28	L28	Applications of Laser	
29	L29	**Unit - I Waves:** Travelling waves, Characteristics of waves, Mathematical representation of travelling waves	
30	L30	General wave equation, Phase velocity	
31	L31	Light source emit wave packets,	
32	L32	Wave packet and Bandwidth, Group velocity and real light waves.	
33	L33	Propagation of light waves: Maxwell's equations	
34	L34	Electromagnetic waves and constitutive relations, Wave equation for free-space	
35	L35	Uniform plane waves, Wave polarization, Energy density	
36	L36	the pointing vector and intensity, Radiation pressure and momentum	

37	L37	Light waves at boundaries, Wave incident normally on boundary	
38	L38	Wave incident obliquely on boundary: law of reflection, Snell's law and reflection coefficients.	

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