HALDIA INSTITUTE OF TECHNOLOGY
LECTURE PLAN

Serving Department: Applied Science | **Batch:**
Semester: 1st & 2nd | **Session:**
Paper Name:Engineering Physics I | **Paper Code:PH 101& PH 201**
Allotted Hour(s):42 | **Actual Hour(s):43**
Name of the Teacher:Dr. S. Mishra

Sl. No.	Date	Topics	50 minutes	Remarks/Books
		Module 1 : Oscillation		
1		Concept of Simple harmonic motion, Solutions, Energy of SHMs, Superposition of S.H.Ms in two mutually perpendicular directions, Lissajous' figures.	2	***A Text of sound*** **N K Bajaj** ***Engg Physics*** **BD Roy**
2		Damped Harmonic Vibration –Differential equation and its solution, Logarithmic decrement, Quality factor.	2	
3		Forced Vibration-Differential equation and its solution, Amplitude and Velocity resonance, Sharpness of resonance, Application L-C-R Circuit.	2	
4		Remedial/Tutorial 1	1	
		Module 2:Optics1		
5		Interference of Electromagnetic waves, Condition for sustained Interference, Conservation of energy and intensity distribution, Double slit as an example, concept of fringe width.	2	***Optics*** **AK Ghatak** ***Optics*** **AK Chakraborty**
6		Qualitative idea of spatial and temporal coherence, Newton's Ring.	1	
7		Diffraction of light –Fresnel and Fraunhofer class, Fraunhofer diffraction for single slit.	1	
8		Derivation and analysis of diffraction pattern for single slit.	1	
9		Analysis of diffraction pattern of double slit, Missing orders in double slit.	1	
10		N slit and plane transmission grating, intensity distribution analysis, Missing orders in N-slit.	1	
11		Rayleigh criteion, Resolving power of grating and microscope.	1	
12		Remedial/Tutorial 2	1	
		Module 3: Optics 2		
13		General Concept of polarization, Plane of vibration and plane of polarization, Qualitative discussion on plane, circularly and elliptically polarized light.	1	***Optics*** **AK Ghatak** ***Optics*** **Jenkins and White**
14		Polarization through reflection and Brewster's law, Malus Law, Double refraction, Ordinary and Extra ordinary rays, Quarter and Half	1	

		Wave Plates.		
15		Nicol's prism-Principle section, principle plane, Optic Axes, Construction and Polaroid, Detection of plane, circularly and elliptically polarized light by using Nicol Prism.	1	
16		Remedial/Tutorial 3	1	

Sl. No.	**Date**	**Topics**	**50 minutes**	**Remarks/Books**
17		Fundamental differences between normal and laser lights, Preleminary idea of Rotational, Vibrational and Electronic Spectra,	1	**Essentials of Laser Physics GD Baruah** **Laser BB Laud**
18		Development of lasing system, Laser: Spontaneous and stimulated emission of radiation, Population inversion, Einstein's A&B co-efficient	2	
19		Optical resonator, condition for active laser action, Meta-stable states, Ruby Laser, He Ne Laser application of laser.	1	
20		Holography-Theory of Holography, Construction reconstruction, Application	2	
21		Remedial/Tutorial 4	1	
		Module 4: Quantum Physics		
22		Basic concepts about relativity, discrepancy in explaining the physical phenomena.	1	***Concept of Modern Physics*** **Auther Baizer**
23		Modification of Newtonian concept to Galilian and Lorentz concept. Length contraction and time dialation.	1	
24		Concept of dependence of mass with velocity, Mass energy equivalence, Energy-momentum, ,	1	
25		Black body radiation-Rayleigh Jeans' law Weins law, Ultraviolate catastrophy, Experimental verifications.	1	
26		Planck's radiation law, calculation of the average energy of the oscillator and total energy radiation.	1	
27		Derivation of Wein's displacement law, Rayleigh Jeans' law, Wien's displacement condition. Stephan's law from Planck's radiation law.	1	
28		Remedial/Tutoria 5	1	
29		Compton Effect, Calculation of Compton wavelength and necessary relations.	1	
30		Wave-particle duality and de broglie's hypothesis, Concept of matter waves.	1	
31		Phase velocity and group velocity, relation between themselves, Some relationship between Phase velocity- group velocity.	1	
32		Devisson-Germer Expt., Heisenberg's Uncertainty Principle.	1	

33		Remedial/Tutorial 6	1	
		Module 5 :Crystalography		
34		Elementary ideas of crystal structure-lattice, basis, unit cell, primitive, non-primitive unit cells, Fundamental types of lattices-Bravis lattices, sc, f.c.c and b.c.c lattices	1	***Engg Physics*** **Bhatacharya and Pal** ***SolidState Physics*** **Babar and Puri** ***Concept of Modern Physics*** **Auther Baizer**
35		Miller Indices and Miller Planes, Co-ordination number and atomic packing factor.	1	
36		X-ray –origin of characteristics and continuous X ray, Bragg's law, Determination of lattice constant.	1	
37		Remedial/Tutorial 7	1	
Total			43	

Signature