PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Applied Sciences and Humanities

Subject Name: -Semiconductor & Quantum Physics

Year/Semester: 1st/Ist　　　　　　　　　　**Subject Code: ASH-103**

LESSON PLAN

Lecture No.	Topics To Be Covered	Tentative Date	Date Covered	COURSE OUTCOME
	Unit-3: Semiconductor Physics			CO3
L 1	Introduction, direct and indirect band gap semiconductors	22/08/24	22/08/24	
L 2	carrier concentration in intrinsic semiconductors	23/08/24	23/08/24	
L 3	carrier concentration in intrinsic semiconductors	27/08/24	27/08/24	
L 4	extrinsic semiconductors: n-type semiconductors,	28/08/24	28/08/24	
L 5	p-type semiconductors, carrier concentration in extrinsic semiconductors	2/09/24	2/09/24	
L 6	variation of carrier concentration with temperature	4/09/24	4/09/24	
L 7	fundamental of semiconductor diode	5/09/24	5/09/24	
L 8	Hall effect and its applications	6/09/24	6/09/24	
L 9	**Superconductors**	9/09/24	9/09/24	
L 10	Revision	11/09/24	11/09/24	
L 11	Revision	12/09/24	12/09/24	
L 12	Assignment –I Discussion	13/09/24	13/09/24	
	Unit-1: Introduction to Quantum Mechanics			CO1
L 13	Basics of quantum mechanics, wave-particle dualism	16/09/24	16/09/24	
L 14	de-Broglie hypothesis, phase velocity, and group velocity	17/09/24	17/09/24	

L 15	Heisenberg's uncertainty principle, application of uncertainty principle	18/09/24	18/09/24	
L 16	wave function properties and physical significance	20/09/24	20/09/24	
L 17	probability density, normalization	23/09/24	23/09/24	
L 18	Eigen values and Eigen functions	30/09/24	30/09/24	
L 19	Quantum mechanical operators	03/10/24	03/10/24	
L 20	postulates of quantum mechanics, Wave-particle duality	04/10/24	04/10/24	
L 21	Phase velocity and group velocity	07/10/24	07/10/24	
L 22	Uncertainty Principle, Applications	09/10/24	09/10/24	
L 23	Schrodinger's wave equation: time-dependent	10/10/24	10/10/24	
L 24	Physical Significance of wave function, particle in a box-energy levels	12/10/24	12/10/24	
L 25	Eigen values and probability densities	14/10/24	14/10/24	
L 26	numerical problems.	15/10/24	15/10/24	
L 27	numerical problems.	23/10/24	23/10/24	
L 28	Revision	24/10/24	24/10/24	
L 29	Assignment -2 Discussion	28/10/24	28/10/24	
	Unit-2: Free Electron and Band Theory of Solids			
L 30	Classical free electron theory (qualitative)	4/11/24	4/11/24	
L 31	quantum free electron theory	8/11/24	8/11/24	CO2
L 32	density of states,	9/11/24	9/11/24	
L 33	Fermi energy, and its importance	11/11/24	11/11/24	
L 34	Bloch theorem	11/11/24	11/11/24	
L 35	Kronig-Penney model (qualitative	12/11/24	12/11/24	

L 36	E versus k diagram-Brillouin zones	13/11/24	13/11/24	
L 37	concept of effective mass of electron	17/11/24	17/11/24	
L 38	energy levels and energy bands	19/11/24	19/11/24	
L 39	distinction between metals, insulators, and semiconductors	20/11/24	20/11/24	
L 40	Revision	21/11/24	21/11/24	
L 41	Assignment -3 discussion	25/11/24	25/11/24	
Unit-4: Lasers and Fiber Optics				CO4
L 42	**Laser:** Basics of interference	26/11/24	26/11/24	
L 43	diffraction, and polarization	27/11/24	27/11/24	
L 44	Lasers and characteristics	28/11/24	28/11/24	
L 45	pre-requisites of lasers,	30/11/24	30/11/24	
L 46	Einstein's coefficients	2/12/24	2/12/24	
L 47	types of lasers, He-Ne laser,	9/12/24	9/12/24	
L 48	semiconductor laser, applications of lasers	10/12/24	10/12/24	
L 49	Fiber Optics: Principle and construction of optical fiber	11/12/24	11/12/24	
L 50	numerical aperture	11/12/24	11/12/24	
L 51	acceptance cone	12/12/24	12/12/24	
L 52	step index and graded index fibers	16/12/24	16/12/24	
L 53	principle of optic fiber communication, optical fiber loss and attenuation	17/12/24	17/12/24	
L 54	Revision	18/12/24	18/12/24	
L 55	Revision	19/12/24	19/12/24	