

PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Applied Sciences and Humanities

Subject Name: - SEMICONDUCTOR PHYSICS

Year/Semester: 1st/ IInd

Subject Code: BS-115A

LESSON PLAN

Lecture No.	Topics To Be Covered	Tentative Date	COURSE OUTCOME
	UNIT I Crystal Structure		CO1
L 1	Crystal Structure: Crystalline and Amorphous solids, Crystal Structure:	22/08/23	
L 2	lattice translation vector, symmetry operations, space lattice, basis	23/08/23	
L 3	Unit cell and Primitive cell, Fundamental types of lattices: two-dimensional	24/08/23	
L 4	three dimensional Bravais lattices; Characteristics of Unit cells	28/08/23	
L 5	Simple Cubic (SC)	29/08/23	
L 6	Bravais Lattices	30/08/23	
L 7	Body Centred Cubic (BCC),	11/09/23	
L 8	Face Centred Cubic (FCC)	12/09/23	
Content beyond Syllabus	Grain and grain boundary	18/09/23	
L 9	Hexagonal Close Packed (HCP) structure	18/09/23	
L 10	Simple crystal structures: Sodium Chloride, Cesium Chloride,	19/09/23	
L 11	Diamond,	20/09/23	
L 12	Various crystal structures	21/09/23	

L 13	Cubic Zinc Sulfide	25/09/23	
L 14	Miller Indices	26/09/23	
L 15	Bonding in Solids	27/09/23	
L 16	Point defects in crystals: Schottky and Frenkel defects.	28/09/23	
L 17	Drawing of Miller Planes	03/10/23	
L 18	Point defects in crystals: Schottky and Frenkel defects.	04/10/23	
L 19	Revision	05/10/23	
	Unit – II Quantum Theory		CO2
L 20	Need and origin of Quantum concept	9/10/23	
L 23	Wave-particle duality	10/10/23	
L 22	Wave-particle duality	11/10/23	
L 23	Phase velocity and group velocity	12/10/23	
L 24	DISCUSSION OF ASSIGNMENT - 1	16/10/23	
L 25	Uncertainty Principle	18/10/23	
L 26	Applications	19/10/23	
L 27	Schrodinger's wave equation: time-dependent	25/10/23	
L 28	time –independent; Physical Significance of wave function ψ .	30/10/23	
L 29	Revision of unit - II	31/10/23	
	UNIT III		
L 30	Band theory of Solids: Bloch theorem, Kronig-Penney Model (qualitative)	2/11/23	
L 31	CONT..... , Kronig-Penney Model	3/11/23	

L 32	E versus k diagram	6/11/23	CO3
L 33	K P MODEL	7/11/23	
L 34	Brillouin Zones	8/11/23	
L 35	Concept of effective mass of electron	9/11/23	
L 36	Energy levels and energy bands	11/11/23	
L 37	Distinction between metals, insulators and semiconductors	20/11/23	
L 38	Discussion on Semiconductors	21/11/23	
L 39	Hall effect and its Applications	23/11/23	
L 40	Free Electron Theory: Classical free electron theory: electrical conductivity in metals, thermal conductivity in metals,	27/11/23	
L 41	Wiedemann-Franz law	1/05/23	
L 42	Discussion of Assignment - 2	4/05/23	
L 43	success and drawbacks of free electron theory	6/05/23	
L 44	Quantum free electron theory: wave function, eigen values	6/05/23	
L 45	Density of states, Fermi-Dirac distribution function	7/05/23	
L 46	Fermi energy and its importance, Thermionic Emission (qualitative)	11/05/22	
	UNIT-IV		
L 47	Semiconductors: Conduction in Semiconductors	12/05/22	
L 48	, Intrinsic Semiconductors: Conductivity of charge carriers,	13/05/22	
L 49	Carrier concentration in intrinsic semiconductors	14/05/22	
L 50	Discussion - Applications of semiconductor	18/05/22	CO4

L 51	Extrinsic Semiconductors: n-type semiconductors, p-type semiconductors	19/05/22	
L 52	charge carrier concentration in extrinsic semiconductors	20/05/22	
L 53	Semiconductor Devices: The p-n junction, Current-voltage characteristics of p-n junction	20/05/22	
L 54	The Transistor: Bipolar Junction Transistor (BJT)	21/05/22	
L 55	Field Effect Transistor (FET)	22/05/22	