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

Subject Name: - SEMICONDUCTOR PHYSICS

Year/Semester: 1st/2nd **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:	19/04/21	
L 2	lattice translation vector, symmetry operations, space lattice, basis	20/04/21	
L 3	Unit cell and Primitive cell, Fundamental types of lattices: two-dimensional	22/04/21	
L 4	three dimensional Bravais lattices; Characteristics of Unit cells	23/04/21	
L 5	Simple Cubic (SC)	26/04/21	
L 6	Bravias Lattices	27/04/21	
L 7	Body Centred Cubic (BCC),	28/04/21	
L 8	Face Centred Cubic (FCC)	29/04/21	
Content beyond Syllabus	**Grain and grain boundary**	30/04/21	
L 9	Hexagonal Close Packed (HCP) structure	03/05/21	
L 10	Simple crystal structures: Sodium Chloride, Cesium Chloride,	4/05/21	
L 11	Diamond,	5/05/21	
L 12	Various crystal structures	06/05/21	

L 13	Cubic Zinc Sulfide	07/05/21	
L 14	Miller Indices	10/05/21	
L 15	Bonding in Solids	11/05/21	
L 16	Point defects in crystals: Schottky and Frenkel defects.	12/05/21	
L 17	Drawing of Miller Planes	13/05/21	
L 18	Point defects in crystals: Schottky and Frenkel defects.	17/05/21	
L 19	Revision	18/05/21	
	Unit – II Quantum Theory		**CO2,CO3**
L 20	Need and origin of Quantum concept	19/05/21	
L 21	Wave-particle duality	20/05/21	
L 22	Wave-particle duality	21/05/21	
L 23	Phase velocity and group velocity	24/05/21	
L 24	DISCUSSION OF ASSIGNMENT - 1	25/05/21	
L 25	Uncertainty Principle	27/05/21	
L 26	Applications	01/06/21	
L 27	Schrodinger's wave equation: time-dependent	2/06/21	
L 28	time –independent; Physical Significance of wave function ψ.	03/06/21	
L 29	Revison of unit - II	04/06/21	
L 30	Revison of unit - II	07/06/21	
L 31	PROBLEMS	08/06/21	
Content beyond	**Particle control in Quantum Mechanics**	9/06/21	

	UNIT III		**CO4**
L 32	**Band theory of Solids:** Bloch theorem, Kronig-Penney Model (qualitative)	10/06/21	
L 33	CONT..... , Kronig-Penney Model	14/06/21	
L 34	E versus k diagram	15/06/21	
L 35	K P MODEL	16/06/21	
L 36	Brillouin Zones	17/06/21	
L 37	Concept of effective mass of electron	18/06/21	
L 38	Energy levels and energy bands	21/06/21	
L 39	Distinction between metals, insulators and semiconductors	22/06/21	
L 40	Discussion on Semiconductors	23/06/21	
L 41	Hall effect and its Applications	24/06/21	
L 42	**Free Electron Theory:** Classical free electron theory: electrical conductivity in metals, thermal conductivity in metals,	25/06/21	
L 43	Wiedemann-Franz law	28/06/21	
L 44	Discussion of Assignment - 2	29/06/21	
L 45	success and drawbacks of free electron theory	30/06/21	
L 46	Quantum free electron theory: wave function, eigen values	6/07/21	
L 47	Density of states	7/07/21	
L 48	Fermi-Dirac distribution function	8/07/21	
L 49	Fermi energy and its importance, Thermionic Emission (qualitative).	9/07/21	

	UNIT-IV		**CO5,C06**
L 50	**Semiconductors:** Conduction in Semiconductors	12/07/21	
L 51	, Intrinsic Semiconductors: Conductivity of charge carriers,	13/07/21	
L 52	Carrier concentration in intrinsic semiconductors	14/07/21	
L 53	Discussion - Applications of semiconductor	15/07/21	
L 54	Extrinsic Semiconductors: n-type semiconductors, p-type semiconductors	16/07/21	
L 55	charge carrier concentration in extrinsic semiconductors	19/07/21	
Content beyond Syllabus	**Introduction to lasers**	21/07/21	
L 56	**Semiconductor Devices:** The p-n junction, Current-voltage characteristics of p-n junction	22/07/21	
L 57	The Transistor: Bipolar Junction Transistor (BJT)	23/07/21	
L 58	Field Effect Transistor (FET)	26/07/21	
L 59	Metal-Semiconductor Junction (Ohmic and Schottky); Semiconductor Laser.	27/07/21	
L 60	REVISION	28/07/21	
L 61	REVISION	29/07/21	
L 62	REVISION	30/07/21	
L 63	REVISION	02/08/21	