Lesson Plan

Name of Faculty : **Dr. Trilok Ranjan Mudgal, Associate Professor**
Discipline : Semiconductor Physics (B24-BSC-101)
Semester : I
Subject : Semiconductor Physics and Physics Laboratory (B24-BSC-111)
Lesson Plan Duration: 15 weeks (July- 2025 to December- 2025)
Work Load (Lecture/Practical) per week (in hours): **Lectures - 06 hours**, **Practicals - 08 hours**

Week	Theory		Practicals	
	Lecture Day	Topic (Including Assignment/Test)	Practical Day	Topic
1st	1	Conductors an overview	1	Magnetic field with distance
	2	Crystalline and Amorphous solids	1	Magnetic field with distance
	3	Translation vector, symmetry operations	1	Magnetic field with distance
	4	space lattice, basis; Unit cell	1	Magnetic field with distance
2nd	5	Fundamental types of lattices	2	V-I characteristics of a diode
	6	2-D and 3-D Bravais lattices	2	V-I characteristics of a diode
	7	Characteristics of Unit cells	2	V-I characteristics of a diode
	8	SC, BCC, FCC Structures	2	V-I characteristics of a diode
3rd	9	HCP structure	3	flashing and quenching potential
	10	NaCl, CsCl, Diamond, ZnS	3	flashing and quenching potential
	11	Miller Indice	3	flashing and quenching potential
	12	Bonding in Solids	3	flashing and quenching potential
4th	13	Point defects in crystals	4	Equipotential lines of bar electrode
	14	Origin of Quantum Theory,	4	Equipotential lines of bar electrode
	15	Phase velocity and group velocity	4	Equipotential lines of bar electrode
	16	Uncertainty Principle	4	Equipotential lines of bar electrode
5th	17	Time-dependent and independent	5	IP of Mercury
	18	Physical Significance of ψ	5	IP of Mercury
	19	Classical free electron theory	5	IP of Mercury
	20	Wave-particle duality,	5	IP of Mercury
6th	21	thermal conductivity in metals	6	Viva-Voce-1
	22	Wiedemann-Franz law	6	Viva-Voce-1
	23	Shortcomings of free electron theory	6	Viva-Voce-1
	24	Quantum free electron theory	6	Viva-Voce-1
7th		**1st Minor Test**		
8th	25	Eigen values	7	To study Hall Effect
	26	Fermi-Dirac distribution function	7	To study Hall Effect
	27	Problems Solutions	7	To study Hall Effect
	28	Fermi energy and its importance	7	To study Hall Effect
9th	29	Thermionic Emission	8	To find e/m for electrons
	30	Bloch theorem,	8	To find e/m for electrons
	31	Kronig-Penney Model	8	To find e/m for electrons
	32	E versus k diagram	8	To find e/m for electrons
10th	33	Brillouin Zones	9	band gap of intrinsic semiconductor
	34	Concept of effective mass	9	band gap of intrinsic semiconductor
	35	Energy levels and energy bands	9	band gap of intrinsic semiconductor
	36	insulators and semiconductors	9	band gap of intrinsic semiconductor
11th		**2nd Minor Test**		
12th	37	Hall effect and its Applications.	10	Resitivity with temperature
	38	Conduction in Semiconductors	10	Resitivity with temperature
	39	Conductivity of charge carriers	10	Resitivity with temperature
	40	Intrinsic Semiconductors	10	Resitivity with temperature
13th	41	Carrier concentration in semiconductor	11	Magnetic field with turns
	42	n-type semiconductors	11	Magnetic field with turns
	43	p-type semiconductors	11	Magnetic field with turns
	44	charge carrier concentration in extrinsic semiconductors	11	Magnetic field with turns
14th	45	p-n junction	12	Viva-Voce-2
	46	V-I characteristics of p-n junction	12	Viva-Voce-2
	47	Transistor: Bipolar Junction Transistor	12	Viva-Voce-2
	48	Field Effect Transistor	12	Viva-Voce-2
15th	49	Metal-Semiconductor Junction	13	Final Submission of Record
	50	Semiconductor Laser	13	Final Submission of Record
	51	Problems Solutions	13	Final Submission of Record
	52	Problems Solutions	13	Final Submission of Record

Lesson Plan

Name of Faculty : **Dr. Trilok Ranjan Mudgal, Associate Professor**
Discipline : Semiconductor Physics **(B24-BSC-101)**
Semester : II
Subject : Semiconductor Physics and Physics Laboratory **(B24-BSC-111)**
Lesson Plan Duration: 15 weeks (January-2026 to May- 2026)
Work Load (Lecture/Practical) per week (in hours): **Lectures 06 hours**, **Practicals - 08 hours**

Week	Theory		Practicals	
	Lecture Day	Topic (Including Assignment/Test)	Practical Day	Topic
1st	1	Conductors an overview	1	To study the Stewart-Gee Apparatus
	2	Crystalline and Amorphous solids	1	To study the Stewart-Gee Apparatus
	3	Translation vector, symmetry operations	1	To study the Stewart-Gee Apparatus
	4	space lattice, basis; Unit cell	1	To study the Stewart-Gee Apparatus
2nd	5	Fundamental types of lattices	2	V-I characteristics of a diode
	6	2-D and 3-D Bravais lattices	2	V-I characteristics of a diode
	7	Characteristics of Unit cells	2	V-I characteristics of a diode
	8	SC, BCC, FCC Structures	2	V-I characteristics of a diode
3rd	9	HCP structure	3	flashing and quenching potential
	10	NaCl, CsCl, Diamond, ZnS	3	flashing and quenching potential
	11	Miller Indice	3	flashing and quenching potential
	12	Bonding in Solids	3	flashing and quenching potential
4th	13	Point defects in crystals	4	Value of Planck's constant
	14	Origin of Quantum Theory,	4	Value of Planck's constant
	15	Phase velocity and group velocity	4	Value of Planck's constant
	16	Uncertainty Principle	4	Value of Planck's constant
5th	17	Time-dependent and independent	5	IP of Mercury
	18	Physical Significance of ψ	5	IP of Mercury
	19	Classical free electron theory	5	IP of Mercury
	20	Wave-particle duality,	5	IP of Mercury
6th	21	thermal conductivity in metals	6	Viva-Voce-1
	22	Wiedemann-Franz law	6	Viva-Voce-1
	23	Shortcomings of free electron theory	6	Viva-Voce-1
	24	Quantum free electron theory	6	Viva-Voce-1
7th		**1st Minor Test**		
8th	25	Eigen values	7	To study Hall Effect
	26	Fermi-Dirac distribution function	7	To study Hall Effect
	27	Problems Solutions	7	To study Hall Effect
	28	Fermi energy and its importance	7	To study Hall Effect
9th	29	Thermionic Emission	8	To find e/m for electrons
	30	Bloch theorem,	8	To find e/m for electrons
	31	Kronig-Penney Model	8	To find e/m for electrons
	32	E versus k diagram	8	To find e/m for electrons
10th	33	Brillouin Zones	9	band gap of intrinsic semiconductor
	34	Concept of effective mass	9	band gap of intrinsic semiconductor
	35	Energy levels and energy bands	9	band gap of intrinsic semiconductor
	36	insulators and semiconductors	9	band gap of intrinsic semiconductor
11th		**2nd Minor Test**		
12th	37	Hall effect and its Applications.	10	Resitivity with temperature
	38	Conduction in Semiconductors	10	Resitivity with temperature
	39	Conductivity of charge carriers	10	Resitivity with temperature
	40	Intrinsic Semiconductors	10	Resitivity with temperature
13th	41	Carrier concentration in semiconductor	11	Equipotential lines of bar electrode
	42	n-type semiconductors	11	Equipotential lines of bar electrode
	43	p-type semiconductors	11	Equipotential lines of bar electrode
	44	charge carrier concentration in extrinsic semiconductors	11	Equipotential lines of bar electrode
14th	45	p-n junction	12	Viva-Voce-2
	46	V-I characteristics of p-n junction	12	Viva-Voce-2
	47	Transistor: Bipolar Junction Transistor	12	Viva-Voce-2
	48	Field Effect Transistor	12	Viva-Voce-2
15th	49	Metal-Semiconductor Junction	13	Final Submission of Record
	50	Semiconductor Laser	13	Final Submission of Record
	51	Problems Solutions	13	Final Submission of Record
	52	Problems Solutions	13	Final Submission of Record