

BHAI GURDAS INSTITUTE OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF APPLIED SCIENCES

LESSON PLAN

**Subject Name: - Semiconductor and Optoelectronics Physics
BTPH-105-18**

Subject Code: -

Year: - 2022-23

Semester: - 2ND

Lecture	Unit	Date/ Week	Topic	Teaching Aids	Reference
Lecture :1	UNIT-I	WEEK-1	ELECTRONIC MATERIALS		Engineering physics by Dr. Rakesh Dogra
Lecture :2			Free electron theory of metals	Explanation through PPT	
Lecture :3			Density of state in 3-D and bloch theorm	Chalk Board	
Lecture :4			Numerical problems	Chalk Board	
Lecture :5		WEEK-2	Kronig penney model	NPTEL Lecture and Lectures	Engineering physics by Dr. Rakesh Dogra
Lecture :6			E-K diagram	Chalk Board	
Lecture :7			Types of electronic materials, semiconductors and insulators	Chalk Board	
Lecture :8			Numerical problems	Chalk Board	
Lecture :9		WEEK-3	Occupation probability, effective mass of electron and hole	Chalk Board	S Chanda Engineering Physiics
Lecture :10			Fermi level	Chalk Board	
Lecture :11			direct and indirect band gaps	Presentation	
Lecture :12			Numerical problems	Chalk Board	
Lecture :13		WEEK-4	Bloch theorm, Density of states in 1-D,2-D, 3-D And origin of energy bands	Presentation	Semiconductor physics by S.P Taneja and Sandeep Rajan
Lecture :14			Problem discussion	Chalk Board	
Lecture :15			Numerical problems	Chalk Board	
Lecture :16	UNIT-II	WEEK-5	Semiconductors	Presentation	Engineering physics by Dr. Rakesh Dogra
Lecture :17			Intrinsic and extrinsic semiconductors	Presentation	
Lecture :18			Carrier concentartion	Presentation	

Lecture :19	UNIT-III		Numerical problems	Chalk Board	
Lecture :20		WEEK-6	Carrier generation and recombination	Presentation	
Lecture :21			Carrier transport	Presentation	
Lecture :22			Diffusion and drift and P-N junction	Chalk Board	
Lecture :23			Numerical problems	Chalk Board	
Lecture :24		WEEK-7	Metal semiconductor junction(ohmic)	Chalk Board	Engineering physics by Dr. Rakesh Dogra
Lecture :25			Metal semiconductor junction(schottky)	Presentation	
Lecture :26			Class Test		
Lecture :27			Numerical problems	Chalk Board	
Lecture :28		WEEK-8	Zener diode and its applications	Chalk Board	
Lecture :29			Physical significance	Presentation	
Lecture :30			Other diodes and its applications	Lecture and Lab work	
Lecture :31			Numerical problems	Chalk Board	
Lecture :32		WEEK-9	Problem discussion	Chalk Board	
Lecture :33			Optoelectronic devices	Lecture and Lab work	Engineering physics by Dr. Rakesh Dogra
Lecture :34			Recombination mechanism	Chalk Board	
Lecture :35			Numerical problems	Chalk Board	
Lecture :36		WEEK-10	Light emitting diodes (working and applications)	Chalk Board	
Lecture :37			Structure of light emitting materials	Chalk Board	
Lecture :38			Basics of laser and applications	Chalk Board	
Lecture :39			Numerical problems	Chalk Board	
Lecture :40		WEEK-11	Stimulated absorption, spontaneous emission and stimulated emission	Chalk Board	S Chanda Engineering Physiics
Lecture :41			Three level laser and meta stable state	Chalk Board	S Chanda Engineering Physiics
Lecture :42			Population inversion and working of lasers and its types and photovoltaics and PIN diode and their working Principle	Presentation	
Lecture :43			Numerical problems	Chalk Board	

Lecture :44	UNIT-IV	WEEK-12	MEASUREMENT TECHNIQUES		Semiconductor physics by S.P Taneja and Sandeep Rajan
Lecture :45			Measurements of divergence and using wavelength using a semiconductor laser	Explanation through PPT	
Lecture :46			Measurements of carrier density and resistivity	Explanation through PPT	
Lecture :47			Numerical problems	Chalk Board	
Lecture :48		WEEK-13	Hall mobility using four probe method	Chalk Board	
Lecture :49			Van der pauw method	Chalk Board	
Lecture :50			Hot point probe measurements	Chalk Board	
Lecture :51			Numerical problems	Chalk Board	
Lecture :52		WEEK-14	Capacitance-voltage measurements and parameter extraction from diode I-V Characteristics	Chalk Board	Semiconductor physics by S.P Taneja and Sandeep Rajan
Lecture :53			Previous year question paper discussion	Class Test	
Lecture :54			Numerical problems	Chalk Board	Engineering physics by Dr. Rakesh Dogra
Lecture :55			Doubt session	Chalk Board	