

Bhoj Reddy Engineering College for Women: Hyderabad

Department of Basic Sciences

Lesson plan of faculty member for the academic year 2017–18

Class: I B Tech

Branch - Section: EEE

Semester: II

Subject: Engineering Physics

Lecture per week: 4

Lecture Number	Topics to be covered	Date (s)
UNIT-I Principles of Quantum Mechanics		
1	Waves and particles	18 December 2017
2	de-Broglie hypothesis, matter waves	18 December 2017
3	Davisson and Germer experiment	20 December 2017
4	Heisenberg uncertainty principle	23 December 2017
5	Schrodinger time independent wave equation	27 December 2017
6	Physical significance of wave function,	30 December 2017
7	particle in 1-D potential box	3 January 2018
8	problems	6 January 2018
9	Electron in periodic potential,	8 January 2018
10	Kronig-Penny model (qualitative treatment)	8 January 2018
11	E-K curve	10 January 2018
12	origin of energy band formation in solids	13 January 2018
UNIT-II Semiconductor Physics		
13	Fermi level in intrinsic semiconductors	17 January 2018
14	Fermi level in extrinsic semiconductors	20 January 2018
15	Calculation of carrier concentration in intrinsic semiconductors	22 January 2018
16	Calculation of carrier concentration in extrinsic semiconductors	22 January 2018
17	Direct and indirect band gap semiconductors	24 January 2018

18	Formation of PN junction	27 January 2018
19	Open circuit PN junction	29 January 2018
20	Energy diagram of PN junction diode	29 January 2018
21	Solar cell: I-V characteristics and applications	31 January 2018
UNIT – III Dielectric Properties		
22	Electric dipole, dipole moment, dielectric constant, polarizability,	3 February 2018
23	Electric susceptibility, displacement vector	5 February 2018
24	Electronic, ionic and orientation polarizations	5 February 2018
25	Calculation of Electronic, ionic and orientation polarizabilities	10 February 2018
26	internal field	12 February 2018
27	Clausius-Mossotti relation	12 February 2018
28	Piezoelectricity , Pyroelectricity	14 February 2018
29	Ferroelectricity-BaTiO ₃ structure	17 February 2018
UNIT – IV Magnetic Properties & Superconductivity		
30	Permeability, field intensity, magnetic field Induction, Magnetization, magnetic susceptibility	19 February 2018
31	Origin of magnetic moment , Bohr magneton	19 February 2018
32	Classification of dia, para and ferro magnetic materials on the basis of magnetic moment	21 February 2018
33	Hysteresis curve based on domain theory	24 February 2018
34	Soft and hard magnetic materials	26 February 2018
35	Properties of antiferro magnetic materials, ferri magnetic materials	26 February 2018
36	Superconductivity: Superconductivity phenomenon	28 February 2018
37	Meissner effect	3 March 2018
38	Applications of superconductors	5 March 2018

UNIT – V Introduction to nanoscience

39	Origin of nanoscience , Nanoscale	7 March 2018
40	Surface to volume ratio	10March 2018
41	Quantum confinement, Dominance of electromagnetic forces	12 March 2018
42	Random molecular motion	12 March 2018
43	Preparation methods of nano materials: Bottomup fabrication: Sol-gel	14 March 2018
44	CVD technique	17 March 2018
45	PVD technique	19 March 2018
46	Top-down fabrication: ball mill method	21 March 2018
47	Characterization by XRD	24 March 2018
48	Characterization by SEM	28 March 2018
49	Characterization by TEM	31March 2018
50	Applications of Nano materials	2 April 2018
51	Revision	2 April 2018

Text book:

1. Solid State Physics, A. J. Dekkar, Macmillan publishers Ind. Ltd.,
2. Solid State Physics, Chales Kittel, Wiley student edition.
3. Fundamentals of Physics, Alan Giambattisa, BM Richardson and Robert C Richardson,
Tata McGraw hill Publishers

Name and signature of the faculty: G Deepthi

Name and signature of Head of the Department: G Vijaya laxmi

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Semester: II

Subject: Engineering Physics lab

Lab per week:3

Lab Number	Topics to be covered	Date (s)
1	Introduction to lab and explanation of experiments	20 December 2017
2	Explanation of experiments	27 December 2017
3	Explanation of experiments	3 January 2018
4	Performance of experiments	10 January 2018
5	Performance of experiments	17 January 2018
6	Performance of experiments	24 January 2018
7	Performance of experiments	31 January 2018
8	Performance of experiments	16 February 2018
9	Performance of experiments	14 February 2018
10	Performance of experiments	21 February 2018
11	Performance of experiments	28 February 2018
12	Performance of experiments	7 March 2018
13	Performance of experiments	14 March 2018
14	Performance of experiments	21 March 2018
15	Performance of experiments	28 March 2018

Enclosure: list of experiments

LIST OF EXPERIMENTS

1. Dispersive power of the material of a prism – Spectrometer.
 2. Determination of wavelengths of white source – Diffraction grating.
 3. Newton's Rings – Radius of curvature of Plano convex lens.
 4. Melde's experiment – Transverse and longitudinal modes.
 5. Charging, discharging and time constant of an R-C circuit.
 6. L-C-R circuit – Resonance & Q-factor.
 7. Magnetic field along the axis of current carrying coil – Stewart and Gees method and to verify Biot – Savart's law.
 8. Study the characteristics of LED and LASER diode.
 9. Bending losses of fibres & Evaluation of numerical aperture of a given fibre.
 10. Energy gap of a material of p-n junction.
 11. Torsional pendulum – Rigidity modulus.
 12. Wavelength of light, resolving power and dispersive power of a diffraction grating using laser.
 13. V-I characteristics of a solar cell.
- Note:** Minimum 10 experiments must be performed.

