PHY 121 SOLID STATE PHYSICS AND BASIC ELECTRONICS 3(2+1)

UNIT I

Diode Characteristics

Diode as circuit element, Load Line concept, Clippers – clampers, Comparators, Sampling Gate, A/D and D/A converter, Numericals

UNIT II

Transistor Characteristics

Applications of a transistor, Different configurations, Phototransistor, Power circuits and systems

UNIT III

Nano Science

Introduction, Structure of Nano materials, nanoparticles, metal nanoclusters, carbon clusters, carbon nanotubes, quantum, nanostructures; Synthesis (Qualitative Idea only), Properties and applications nanostructured materials.

UNIT IV

Optoelectronic Devices

Introduction, Photo Luminescence, Cathode Luminescence, Electro Luminescence, Injection Luminescence, Injection Luminescence, LED, Plasma Display, Liquid Crystal Displays, Numeric Displays; Photo detector, Thermal detector, Photo Devices, Photo Conductors, Photo diodes, Detector Performance.

Practical

1. Study of Electronic Instruments
2. Multimeter measurements on DC resistive circuits
3. Fibre Optics (Part I, II, III)
4. Study of different Logic Gates (Part I, II, III, IV, V)
5. Introduction to Sensor systems

Reference Books

1. Principle of Electronics by V K Mehta
2. J. Wilson and J Haukes, "Opto Electronics – An Introduction", PHI, New Delhi, 1995.
3. Modern Digital Electronics – R P Jain *(Tata McGraw Hill 3rd Ed.)*
4. Digital Principles and Applications – Malvino & Leach *(Tata McGraw Hill)*
5. Bhattacharya "Semiconductor – Opto Electronic Devices", PHI, New Delhi, 1995.

Practical Books

1. Advanced Practical Physics by Wornsop & Flint
2. Advanced Practical Physics Vol I by S p Singh (Pragati Prakashan)
3. Linear Integrated Circuits by Shail B Jain & B Roy Choudhury (New Age Int. Pub.) 2nd Ed.
4. Linear Integrated Circuits by Shalivahanan & V S Bhaaskaran (TMH, 2008)