

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Metallurgy and Material Science - Optoelectronic Materials and Devices

Subject Co-ordinator - Prof. Deepak Gupta, Prof. Monica Katiyar

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Conductivity of materials, Drude's theory and its failures
- Lecture 2 - Free electron theory
- Lecture 3 - Free electron theory
- Lecture 4 - Crystal structure, Reciprocal lattice I
- Lecture 5 - Reciprocal lattice II, Brillouin zone and Bragg's diffraction condition
- Lecture 6 - Electrons in a crystal, Bloch's electron
- Lecture 7 - Free electron band diagrams in an empty lattice
- Lecture 8 - Effect of periodic potential, Origin of band-gap through Kronig-Penny model
- Lecture 9 - Electron dynamics
- Lecture 10 - Conduction in relation to band diagrams
- Lecture 11 - Semiconductor E-k diagrams and their material properties
- Lecture 12 - Equilibrium carrier statistics in semiconductors
- Lecture 13 - Equilibrium carrier statistics in semiconductors
- Lecture 14 - Equilibrium carrier statistics in semiconductors
- Lecture 15 - Doping in semiconductors
- Lecture 16 - Equilibrium carrier statistics in semiconductors
- Lecture 17 - Equilibrium carrier statistics in semiconductors
- Lecture 18 - Semiconductor junctions in band-diagrams
- Lecture 19 - Linear dielectric behavior
- Lecture 20 - Non-linear dielectric behavior
- Lecture 21 - Carrier recombination-generation - I
- Lecture 22 - Carrier recombination-generation - II
- Lecture 23 - R-G statistics via R-G centers
- Lecture 24 - Optoelectronic materials and bandgap engineering
- Lecture 25 - Optical properties of materials
- Lecture 26 - Optical properties of single interfaces
- Lecture 27 - Optical Properties of two interfaces
- Lecture 28 - Drift
- Lecture 29 - Diffusion

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- Lecture 30 - Continuity Equation
- Lecture 31 - Resistor and diode (p-n junction)
- Lecture 32 - Fundamentals of p-n junction
- Lecture 33 - Fundamentals of p-n junction (Continued...)
- Lecture 34 - Solar cells
- Lecture 35 - Microelectronics processing
- Lecture 36 - MOS capacitor
- Lecture 37 - Transistor
- Lecture 38 - Organic Electronics
- Lecture 39 - Organic Light Emitting Diodes
- Lecture 40 - Organic Solar Cells and Organics Thin Film Transistors