

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

NPTEL Video Course - Metallurgy and Material Science - Physics of Materials

Subject Co-ordinator - Dr. Prathap Haridoss

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Properties of Materials
- Lecture 3 - Thermal Expansion
- Lecture 4 - Measuring Electrical Conductivity
- Lecture 5 - Free Electron Gas
- Lecture 6 - The Ideal Gas
- Lecture 7 - Drude Model
- Lecture 8 - Drude Model
- Lecture 9 - Drude Model
- Lecture 10 - Drude Model
- Lecture 11 - Large Systems and Statistical Mechanics
- Lecture 12 - Maxwell Boltzmann Statistics
- Lecture 13 - Classical Particles and Quantum Particles
- Lecture 14 - History of Quantum Mechanics - 1
- Lecture 15 - History of Quantum Mechanics - 2
- Lecture 16 - Introduction to Drude Sommerfeld model
- Lecture 17 - Fermi-Dirac Statistics - Part 1
- Lecture 18 - Fermi-Dirac Statistics - Part 2
- Lecture 19 - Features of the Fermi Dirac Distribution Function
- Lecture 20 - Maxwell-Boltzmann Distribution Vs Fermi-Dirac Distribution
- Lecture 21 - Anisotropy and Periodic Potential in a Solid
- Lecture 22 - Confinement and Quantization - Part 1
- Lecture 23 - Confinement and Quantization - Part 2
- Lecture 24 - Density of States
- Lecture 25 - Fermi Energy, Fermi Surface, Fermi Temperature
- Lecture 26 - Electronic Contribution to Specific Heat at Constant Volume
- Lecture 27 - Reciprocal Space-1
- Lecture 28 - Reciprocal Space-2
- Lecture 29 - Reciprocal Space-3

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- Lecture 30 - Wigner Seitz Cell and Introduction to Brillouin Zones
- Lecture 31 - Brillouin Zones, Diffraction, and Allowed Energy Levels
- Lecture 32 - E Vs k, Brillouin Zones and the Origin of Bands
- Lecture 33 - Calculating Allowed Energy Bands and Forbidden Band Gaps
- Lecture 34 - Bands; Free Electron Approximation, Tight Binding Approximation
- Lecture 35 - Semiconductors
- Lecture 36 - Magnetic Properties
- Lecture 37 - Electron Compounds; Phonons, Optoelectronic Materials
- Lecture 38 - Superconductivity
- Lecture 39 - Bose-Einstein Statistics
- Lecture 40 - Physics of Nano Scale Materials; Course Summary