

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

NPTEL Video Course - Electrical Engineering - NOC: Fundamentals of Semiconductor Devices

Subject Co-ordinator - Prof. Digbijoy N. Nath

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to semiconductors  
Lecture 2 - Introduction to energy bands  
Lecture 3 - Fundamentals of band structure  
Lecture 4 - Band structure (Continued...) and Fermi-Dirac distribution  
Lecture 5 - Density of states  
Lecture 6 - Doping and intrinsic carrier concentration  
Lecture 7 - Equilibrium carrier concentration  
Lecture 8 - Temperature-dependence of carrier concentration  
Lecture 9 - High doping effects and incomplete ionization  
Lecture 10 - Carrier scattering and mobility  
Lecture 11 - Low-field and high-field transport, introduction to diffusion  
Lecture 12 - Drift-diffusion and trap statistics  
Lecture 13 - Current continuity equation  
Lecture 14 - Continuity equation (Continued...) and introduction to p-n junction  
Lecture 15 - p-n junction under equilibrium  
Lecture 16 - p-n junction under equilibrium (Continued...)  
Lecture 17 - p-n junction under bias  
Lecture 18 - p-n junction under bias (Continued...)  
Lecture 19 - p-n junction  
Lecture 20 - Application of p-n junctions  
Lecture 21 - Breakdown of junction and C-V profiling  
Lecture 22 - Introduction to Schottky junction  
Lecture 23 - Schottky junction under equilibrium  
Lecture 24 - Schottky junction under bias  
Lecture 25 - Introduction to transistors  
Lecture 26 - Basics of BJT  
Lecture 27 - Working of BJT  
Lecture 28 - Working of BJT (Continued...)  
Lecture 29 - Delays in BJT

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Lecture 30 - MOS  
Lecture 31 - MOS  
Lecture 32 - Ideal MOS system  
Lecture 33 - MOS C-V in more details  
Lecture 34 - MOSFET - An introduction  
Lecture 35 - Gradual Channel Approximation  
Lecture 36 - Substrate bias effect and subthreshold conduction in MOSFET  
Lecture 37 - Short Channel Effects in MOSFET  
Lecture 38 - Introduction to compound semiconductors  
Lecture 39 - Basics of heterojunctions  
Lecture 40 - Band diagram of heterojunctions  
Lecture 41 - Heterojunctions (Continued....)  
Lecture 42 - Heterojunction transistors  
Lecture 43 - III-nitrides  
Lecture 44 - Solar cell basics  
Lecture 45 - Solar cell (Continued...)  
Lecture 46 - Solar cell  
Lecture 47 - Basics of photodetectors  
Lecture 48 - Photodetectors  
Lecture 49 - Junction photodetectors  
Lecture 50 - Basics of recombination  
Lecture 51 - Basics of LED  
Lecture 52 - LED  
Lecture 53 - Visible LED  
Lecture 54 - Transistors for power electronics  
Lecture 55 - Transistors for power electronics (Continued...) and for RF electronics  
Lecture 56 - Transistors for RF (Continued...) and transistors for Memory  
Lecture 57 - Basics of microelectronic fabrication  
Lecture 58 - Microelectronic fabrication (Continued...)  
Lecture 59 - Summary