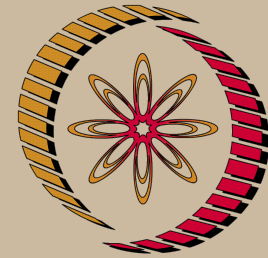


# Solid State Devices - Video course



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## Electronics & Communication Engineering

**Coordinators:**

**Prof. S. Karmalkar**  
Department of Electrical Engineering IIT Madras

TOPIC	No. of lectures
Introduction	1
Evolution and uniqueness of Semiconductor Technology	1
Equilibrium carrier concentration Thermal Equilibrium and wave particle duality Intrinsic semiconductor $\emptyset$ Bond and band models Extrinsic semiconductor $\emptyset$ Bond and band models	5
Carrier transport Random motion Drift and diffusion	2
Excess carriers Injection level Lifetime Direct and indirect semiconductors	2
Procedure for analyzing semiconductor devices Basic equations and approximations	1
P-N Junction Device structure and fabrication Equilibrium picture DC forward and reverse characteristics Small-signal equivalent circuit Switching characteristics Solar cell	6
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Bipolar Junction Transistor History Device structures and fabrication Transistor action and amplification Common emitter DC characteristics Small-signal Equivalent circuit vEbers-Moll model SPICE model	6
MOS Junction C-V characteristics, threshold voltage, body effect	3
Metal Oxide Field Effect Transistor History Device structures and fabrication Common source DC characteristics Small-signal equivalent circuit SPICE level-1 model	8

Differences between a MOSFET and a BJT	
Junction FET and MESFET	2
Recent Developments Heterojunction FET Hetrojunction bipolar transistor	2
Summary	1
Total number of lectures	40

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