EC 204 SEMICONDUCTOR DEVICES 3 credits [3-0-0]

Prerequisites: EC 100: Basic Electronics

Semiconductor Crystals: Atomic Bond Model; Drift: Energy Bands, Ohm's Law, Carrier mobility; Diffusion: Current equation, Einstein's Relationship, Continuity equation; Generation & Recombination: Mechanisms, Minority Carrier Lifetime; P-N junction: Principles, DC model, Capacitance of Reverse bias PN junction, store charge effects, Metal Semiconductor contacts: Schottky diode, Mos Capacitor; MOSFET: Principles, C-V Characteristics, Second order effects; BJT: Principles, C-V Characteristics, Second order effects; IC Technology: Diode in IC Technology, MOSFET Technologies; Bipolar IC Technologies; Photonic Devices: LEDs, Photo Detectors, Solar Cells, LASERs; Microwave FETs & Diodes; Power Devices: IGBT, Thyristors

Essential Reading:

1. S. Dimitrijev, *Principles of Semiconductor Devices:* Oxford University Press, 2005

Supplementary Reading:

1. Benman- *Introduction to Semi conductor Devices* – Cambridge. 2004
2. Dasgupta & Dasgupta, *Semiconductor Devices* **PHI, 2004**