

## **EE108 - Electronic Physics**

Electron Ballistics; Atomic Structure and Band Theory; Electrical Conduction in Metals; Semiconductor Physics; P-N Junction: pn junction at open circuit, forward bias, diffusion & recombination current components at forward bias, reverse bias, pn junction band diagram, depletion layer capacitance, diffusion capacitance, tunneling phenomenon, avalanche and zener breakdowns, Diode Applications: the diode as a circuit element, the diode as a non-linear device, static & dynamic resistance of the diode, piece-wise linear equivalent circuits, clipping circuits, clamping circuits, rectifier circuits, voltage regulation and ripple factor, the harmonic components in rectifier circuits, Inductive filters, capacitive filters, L-section filters,  $\pi$ -section filters, multiple L-section filters, d.c. power supplies, regulator circuits using zener diodes, regulator circuit stability, voltage multipliers, function generation; Other Devices: light emitting diodes, solar cells, photo diodes, pin diodes, semiconductor lasers, bipolar transistor (BJT), common base dc c/cs, common base amplifier, common emitter dc c/cs, low frequency small signal model, thyristor basic c/cs, triggering the SCR, SCR turn-off, other device structures.