



Problem Solving Tutorials on Semiconductor Devices

Name of the PMRF student

Rasik Rashid Malik

Required background of the students taught

Post Graduate / Undergraduate course: EE, ECE, Materials science Engg., Physics and other related departments (s)

Prerequisite: Elementary Knowledge of semiconductor devices

Details of the content of the module

Each Lecture will briefly brush-up the theory, followed by a detailed problem-solving tutorial on the following topics:

Week 1: Allowed and Forbidden Energy Bands, Electrical Conduction in Solids, Density of States Function, Statistical Mechanics

Week 2: Charge Carriers in Semiconductors, Dopant Atoms and Energy Levels, Statistics of Donors and Acceptors, Charge Neutrality, Position of Fermi Energy Level

Week 3: Carrier Drift, Carrier Diffusion, Graded Impurity Distribution, The Hall Effect, Carrier Generation and Recombination, Mathematical Analysis of Excess Carriers, Ambipolar Transport, Quasi-Fermi Energy Levels, Excess Carrier Lifetime

Week 4: PN junction - Zero Applied Bias, Reverse Applied Bias, Junction Breakdown, Nonuniformly Doped Junctions, pn Junction Current, Generation-Recombination Currents,

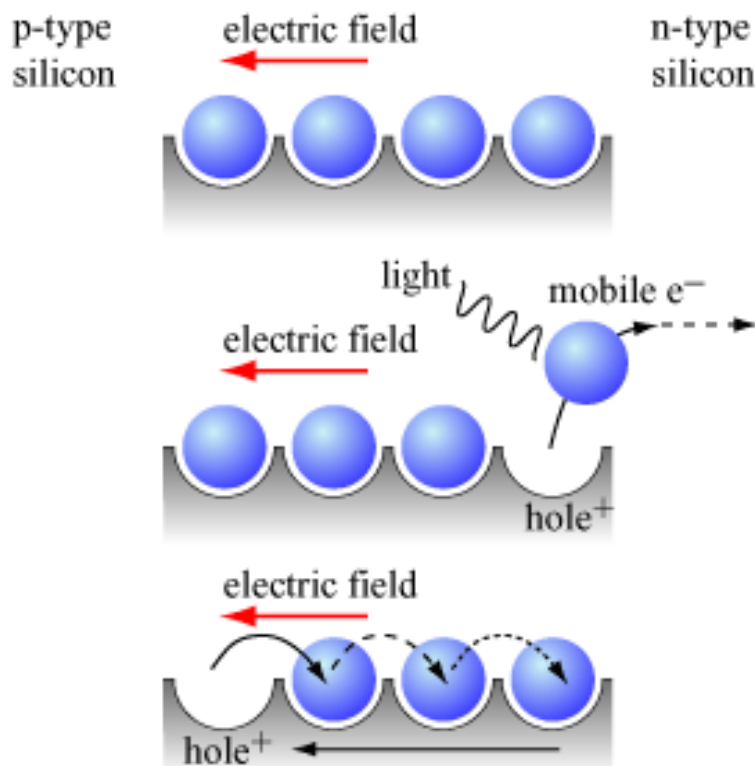
Week 5: The Schottky Barrier Diode, Metal-Semiconductor Ohmic Contacts, Heterojunctions

Week 6: The Two-Terminal MOS Structure, CV Characteristics, The Basic MOSFET Operation

Week 7: Optical Absorption, Solar Cells, Photodetectors, Photoluminescence and Electroluminescence, Light Emitting Diodes, Laser Diodes

Online session coordinator

Will be chosen from the list of registrants



Schedule of the module

Start Date: 15 Oct 2023

Tentative End Date: 9 Dec 2023

(may get extended by a week or 2)

Day: The lectures will either be recorded and uploaded or presented live every Saturday and Sunday

Time: 6 PM – 8PM IST

Meeting link : [will be shared later](#)

Contact email ID: issf.forum@gmail.com

Registration link:
<https://forms.gle/i5vz3EKdXUMdXuSY9>