Fundamentals of Solid-State Electronics
EL6513

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Solid-State Electronics

Textbooks: Physics of semiconductor devices by Sze (Main book); Solid-state electronics devices by Streetman

Grading policy:
20% Homework
20% Midterm exam
30% Project
30% Final exam

Midterm and final exams are open book and closed notes.

Syllabus

Week 1: Crystals and electrons in crystals, Energy bands, electrons and holes; Fermi level position
Week 2-3: Excess carriers in semiconductors; Charge carrier transport: drift & diffusion
Week 4-5: p/n junction diode
Week 5-6: Metal-semiconductor Junction, heterostructures
Week 7: Midterm exam (Oct 23, 75min), MOS capacitors
Week 8: Metal/oxide/semiconductor (MOS) capacitor
Week 9: Junction field effect transistor (JFET)
Week 10-11: MOS Field-effect transistor (MOSFET)
Week 12-13: Bipolar junction transistor (BJT)
Week 14: Other devices (optoelectronic; power; high frequency)—covered in the form of seminar by students.
Week 15: Final exam