

What is Electronics/Photonics?

- Understanding the physics of devices
 - diodes, transistors, lasers, detectors, ...
- Understand the materials
 - semiconductors, metals, insulators, superconductors
- Application to IC design and fabrication
 - analog, digital, microwave, optical

Senior Electives

- Semiconductor physics: ECE162ABC
- Integrated electronics: ECE 123, 120AB, 122A
- MEMs: ECE141ABC
- High frequency electronics: ECE145ABC
- E/M and optical fiber: ECE144, 135

Semiconductor Physics Series

162A **Quantum Mechanics**

- learn to think small! put an electron in a box

162B **Solid State Physics**

- crystal structure, electrons in solids, applications

162C **Optoelectronic Materials and Devices**

- “sheds light” on semiconductor photonic devices!
- lasers, LEDs, detectors, solar cells

- **Prerequisites: ECE 130AB + 134**

Integrated Electronics

122A (F), 122B (W) **VLSI Principles**

- IC design at the transistor level
- Issues in nanoscale CMOS
- CAD tools
- Interconnections and packaging
- Design project

- **ECE 122A prerequisites: ECE152A**
- **ECE 122B prerequisites: ECE 123 or ECE 122A**

Integrated Electronics

120A or 123 and 120B

IC Design and Fabrication (WS)

- Semiconductor device processing
- Fabricate ICs in the solid state lab
- **ECE 120A prerequisite: ECE132**

Micro-Electro-Mechanical (MEMs)

- **ECE141ABC MicroElectroMechanical Systems (MEMS)**
 - Integrated actuators, sensors, processing techniques, microfluids
- **Prerequisites: ECE130A; ECE137A**

High Frequency Electronics

- 145AB Communication Electronics (FW)
 - Design of high frequency wireless communication circuits
- 145C High Speed Bipolar Mixed Signal IC design (S)
 - High speed circuits for broadband communications
- Prerequisites: ECE137AB

E/M and applications

- ECE144 Electromagnetic Fields & Waves (W)
 - Physics and applications of E&M
- Prerequisite: ECE134
- ECE135 Optical Fiber Communication (S)
 - Physics, components, and applications
- Prerequisites: ECE132 and ECE134

Design – Second Sequences

Design:

- ECE 120A & 120B
- ECE 122A & 122B
- ECE 145A & 145B

Second:

- ECE 122A & 120A
- ECE 123 & 122B
- ECE 145A & 145C