

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: ECE124ABC, 125
- 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: 130B + 134 Fall Junior year**

Integrated Electronics

124A (F), 124D (W), 125 (W) **VLSI Principles**

- IC design at the transistor level
 - Issues in nanoscale CMOS
 - CAD tools
 - Interconnections and packaging
 - Design project
- **Prerequisites: ECE132; ECE152A**

Integrated Electronics

124B,C **IC Design and Fabrication (WS)**

- Semiconductor device processing
- Fabricate ICs in the solid state lab
- Prerequisites: **ECE132 OR ECE137AB**

Micro-Electro-Mechanical (MEMs)

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

High Frequency Electronics

- 145AB Communication Electronics (WS)
 - Design of high frequency wireless communication circuits
- 145C High Speed Bipolar Mixed Signal IC design (F)
 - 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 Sequences

- ECE124AB; 124AD; 124BC
- ECE145AB; 145AC

Information

- For course syllabi and weblinks:
http://www.ece.ucsb.edu/current_courses.shtml
- My presentation:
xanadu.ece.ucsb.edu/~long