

ECE 4314: Solid State Devices

Credit / Contact hours: 3 / 3

Course coordinator: Zhaoyang Fan

Textbook(s) and/or other required material: B.G. Streetman and S. Banerjee, Solid State Electronic Devices, 6th ed., Person Prentice Hall 2006

Catalog description: Principles and properties of semiconductor devices and optical devices. Thyristors and other switches. Integrated circuit devices. Device modeling.

Pre-requisite(s) or co-requisites: ECE 3312, 3341

Designation: Elective

Course learning outcomes: Upon completion of this course students should be able to do the following:

1. Describe the fundamental semiconductor properties.
2. Describe the principle and analyze the operation of p-n diodes.
3. Describe the principle and analyze the operation of BJTs.
4. Describe the principle and analyze the operation of MOSFETs.
5. Describe the fundamentals of optoelectronic devices.

Student outcomes addressed: a, e, and k.

Topics covered:

Fundamental of semiconductors – 8 hours

Semiconductor junctions – 5 hours

Bipolar junction transistors– 7 hours

Field-effect transistors and IC – 12 hours

Optoelectronic devices – 3 hours

Other semiconductor devices – 4 hours

Review – 3 hours

Tests – 3 hours