

ECE 3311: Electronics I

Credit / Contact hours: 3 / 3

Course coordinator: James Dickens

Textbook(s) and/or other required material: Sedra and Smith, Microelectronic Circuits, Oxford University Press 2010. (Recommended)

Catalog description: Introduction to electronic devices, amplifiers, and electronic systems. Principles of electronic circuit design and analysis.

Pre-requisite(s) or co-requisites: ECE 3302.

Designation: Required

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

1. Analyze and design electronic circuits using operational amplifiers.
2. Analyze and design electronic circuits using diodes.
3. Analyze and design electronic circuits using transistors.
4. Analyze biasing circuits and small-signal single stage amplifiers without the use of a computer.
5. Analyze biasing circuits and small-signal single stage amplifiers with the use of a computer.
6. Describe the physical operation of basic semiconductor devices.

Student outcomes addressed: a, c, e, and k.

Topics covered

Basic electronic circuit design – 1 hour

Operational amplifiers – 4 hours

Diodes: models, circuit applications, physical operation, computer-aided analysis– 5 hours

Field-effect transistors: physical operation, models, biasing – 4 hours

Field-effect transistors: small-signal single-stage amplifiers (configuration, frequency response, computer-aided analysis, design) – 10 hours

Bipolar junction transistors: physical operation, models, biasing – 4 hours

Bipolar junction transistors: small-signal single-stage amplifiers (configuration, frequency response, computer-aided analysis, design) – 10 hours

Tests – 3 hours