

EECE 315

Electronics I

4 Units: 3 hours lecture, 3 hour lab (Engineering topics)

Course Supervisor/Main Instructor: Meghdad Hajimorad/Ghang-Ho Lee and Meghdad Hajimorad

Required Textbook and Other Course Materials

Textbook

Fundamentals of Microelectronics, 2nd Ed, B. Razavi, Wiley, 2013

Software and other equipment

- Personal computer (Laptop) with webcam and microphone.
- Software, Analog Devices, LTSpice (circuit simulation).
- Software, Zoom.
- Analog Devices, ADALM2000 Active Learning Module (M2K).
- Digilent, BNC Breakout Board and accessories. (BNC cable, two oscilloscope probes).
- EECE parts kit, Breadboard, and Wire Kit.
- More detailed information on EECE parts and M2K loan are posted on EECE website.

<https://www.csuchico.edu/eece> .

Course Description:

Ideal diodes. Zener diodes and regulation. Photodiodes and solar cells. Biasing and DC behavior of bipolar transistors. JFETs and MOSFETS. Small-signal AC equivalent circuits. Single-state transistor amplifiers. Low-frequency response. Discrete feedback amplifiers. 3 hours lecture, 3 hours laboratory.

Prerequisites: EECE 211, EECE 211L; EECE 311 and MATH 260 (may be taken concurrently)

Learning Objectives:

Students shall be able to:

- explain the basic concept of semiconductor physics. (SO 3)
- understand PN junction diode and able apply to circuit applications. (SO 1)
- understand BJT (Bipolar Junction Transistor) and able to design BJT amplifiers. (SO 1, 2, and 6)
- understand FET (Field-Effect Transistor) and able to design FET amplifiers. (SO 1, 2, and 6)
- able to design basic analog circuits and understand the concept of large-scale integrated circuits. (SO 1, 2, and 6)

Course Topics:

- Introduction of basic semiconductor physics.
- PN junction diode and circuit applications.
- BJT (Bipolar Junction Transistor) and circuit applications.
- BJT amplifier design and analysis.
- FET (Field-Effect Transistor) and circuit applications.
- FET amplifier design and analysis.
- Frequency Responses of BJT and FET.

Grading Scheme:

Homework - Design	20%
Laboratory	20%
Midterm exam 1	15%
Midterm exam 2	15%
Final exam	30%