ECE 321 Electronics I Syllabus September 2015

Course Description

This course is an introduction to the physical properties and characteristics of the three basic solid-state electronic devices: diodes, field effect transistors, and bipolar junction transistors. After starting with a brief overview of semiconductor physics, the emphasis for the rest of the course will be on the physical operation of the devices, their operating characteristics, and their analysis using equivalent circuit models. We will also examine applications of the devices in circuits such as amplifiers, switches, regulators, rectifiers, and simple digital gates.

Schedule—Fall Quarter 2015
Tuesday and Thursday 12:00 noon to 1:50, EB102 on campus

Course Outcomes

Understanding basic semiconductor properties, conduction by drift and diffusion, PN junctions
Analysis and Design of diode circuits for power regulation, rectification, and wave shaping
Understanding the principles of Field Effect and Bipolar Junction Transistors
Analysis and Design of FET switches, including biasing
Analysis of NMOS and CMOS Inverters
Use of circuit simulation tools for the analysis and design of diode, FET and BJT circuits
Introduction to Analog Integrated Electronics Projects
Collecting information and technical descriptive writing on current topics in electronics

Textbook: Microelectronic Circuit Design, by Jaeger and Blalock, 4th or 5th edition

The goal of this course is to introduce students to the first steps on a path to a life-time journey as an electronic designer.

Course structure: weekly study guides with ungraded homework assignments and prep material for quizzes and exam. Three 1 hour graded quizzes. Comprehensive 2 hour final exam. 4 graded laboratories.

Classroom environment: The lectures are recorded for later review, but classroom attendance is expected and necessary for success. Lectures include considerable interaction and question-answer discussion.

Class grading is roughly 20% for each quiz and 40% for the comprehensive final exam and writing assignment. The Laboratory is an essential component of course learning, and lab grades and performance can have a significant positive or negative impact on course grade.

Three 1 hour in-class quizzes and comprehensive final exam. A writing assignment will be submitted with the final exam. Four laboratories with reports.