

ME 100 Fall 2019

Course Overview

Course Description

In the Lectures: overview of central ideas in electrical Engineering: design and analysis of analog circuits, RLC filters, operational amplifiers, diodes, digital electronics, combinatorial and sequential circuits, applications to communication, signal processing, computer architecture.

In the laboratory and Project: Design interfaces between the physical world and the internet using sensors, motors, and inexpensive microcontrollers.

Outline and Learning Objectives

Electronics has become pervasive in our lives as a powerful technology with applications in a wide range of fields including healthcare, home automation, environmental monitoring, robotics, or entertainment. This course has two objectives: (a) to offer a broad overview of electronics and electrical engineering principles, and (b) to teach you how to build electronic circuits that interact with the physical world through sensors and actuators and communicate wirelessly with the internet to cooperate with other devices and with humans. In lecture we will build up from basic elements all the way to advanced applications such as communication systems, signal processing, and logic circuits. In the laboratory you will design and build representative samples such as an autonomous solar weather station and robots that exchange information with and are controlled from the cloud.

Prerequisites

Familiarity with computer programming such as taught in E7, CS10, CS61A or DS8. The lab component of the course will use the Python programming language. Basic Physics and Calculus.

Textbook

There is no textbook for the class. *Hambley, Electrical Engineering: Principles and Applications, Prentice Hall* is a good reference for some of the material taught. The book is pretty expensive, and not worth buying, unless your last name is Gates. We will post relevant reading material on bCourses in lieu of a textbook. We will post some lectures on bCourses. Many lectures will be on the chalkboard and will not be posted.