ECE 463: Digital Communications Lab

Instructors:

Historically, this class has been taught by Dr. Chris Schmitz. In its most recent offering in Spring 2016, this course was taught by Dr. Serge Minin. The course director for this class is Dr. Steve Franke.

Prerequisites:

ECE 453, ECE 459, or ECE 461. The topical prerequisites are modulation theory, Fourier analysis, waveform analysis at the level of an introductory undergraduate communications course. Students should be familiar with MATLAB and/or python.

When to Take It:

This class should be taken after ECE 453, ECE 459, or ECE 461. This class is a lab class and should be taken during late Junior or early Senior year.

Class Content:

ECE 463 is a lab class that follows after taking one of the fundamental communications class ECE 453, ECE 459, and ECE 463. As these classes teach you the fundamental theory of communication systems like modulation, pulse shaping, noise processes, filter design, etc., ECE 463 will allow you to practice these concepts in a lab environment. The class is structured as a 1 hour lecture and a 3 hour lab.

In the 1 hour lab, you will go over some fundamental communications concepts for the lab. In the lab section, you will perform a series of MATLAB exercises where you analyze radio and waveform data. In addition, these exercises will also have you design software demodulate, decode, and filter interesting radio data: FM radio, television, airplane communications. The labs will also have you use GNU Radio Companion to build custom digital radios on Software Defined Radios.

This class is the analog of ECE 420 after taking ECE 310.

Work:

This class is just graded on attendance, labs reports, a final group project, and an individual paper. The workload is comparable to ECE 420. One should expect to spend 3 to 4 hours outside of normal class hours. This may vary downward or upward depending on if a lab deadline is coming up.

Life After:

In terms of practical lab coursework in digital communications, ECE 463 is the only one. Interested students who are interested in continuing this study should conduct research with a Professor or take a graduate digital communications course like ECE 562.