

## **EECE 4356 Digital Signal Processing**

Catalog Description: (4 cr) Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period.  
Prerequisite: Third semester calculus.

Textbook: No textbook. Professor's lecture notes.

Course Objectives: Students learn how to implement fundamental concepts and methods of signals and systems. Implementation is accomplished via Matlab on the students' personal computers. Coverage includes digital filter specification, design and implementation, spectrum analysis, spectrogram, linear predication and autoregressive signal models and system identification. Additionally, projects based on digital music and speaker recognition are assigned. This course complements and extends the student's knowledge of discrete-time signals and systems (EECE3214).

Relationship to Outcomes:

(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Class Schedule:

3 classes per week of 50 minutes each

Topics:

- Sampling
- Discrete-Time Signals and Systems
- Discrete Fourier Transform (DFT) / Fast Fourier Transform (FFT)
- Spectrum Analysis
- Spectrograms
- Digital Filter Specification, Design and Implementation
- Linear Prediction/Autoregressive Signal Models
- System Identification
- Applications to speech processing
- Digital signal processing chips

Prepared by: Mitch Wilkes

Grading:

Two projects 25% each

Midterm exam 30%

Homework 20%