EEL 4510 Intro to Digital Signal Processing

Credits: 3

Text book, title, author, and year: "Digital Signal Processing by J. Proakis and D. Manolakis. Pearson/Prentice Hall

Supplemental materials: none.

Specific course information
   a. **Catalog description:** Sampling and data acquisition, design of simple digital filters, programming and hardware implementation, audio applications, basic spectrum analysis using FFT
   b. **Prerequisites:** EEL 4656
   c. **Required, elective, or selected elective:** Required

Specific goals for the course
Specific outcomes of instruction: By the end of the course students will be able to: (i) will understand the fundamentals of continuous-time, discrete-time and digital signals and the properties of Linear-Time Invariant (LTI) digital systems and how to use them; (ii) understand Nyquist sampling theorem for both baseband and bandpass signals; (iii) learn and practice Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT) and the concept of spectral computation; (iv) learn and be able to use Z-Transform; (v) understand system concepts by learning Transfer Functions and Stability.

Brief list of topics to be covered:

- Linear Systems, Input/Output relationships and properties
- Introduction to MATLAB and Relevant Mathematics
- Discrete-Time Signals
- Frequency Domain Concepts
- Sampling and Reconstruction
- Discrete Fourier Transforms
- The Z-Transform, poles and zeros of linear systems
- FIR Filter Design and Analysis
- IIR Filter Design and Analysis