

ECE 4364: Digital Signal Processing

Credit / Contact hours: 3 / 3

Course coordinator: Tanja Karp

Textbook(s) and/or other required material: Oppenheim and Schaffer, Discrete Time Signal Processing, 3E, Prentice Hall, 2009.

Catalog description: An introduction to digital signal processing. Sampling, z-transform, discrete and fast Fourier transforms, flowgraphs, design techniques for digital filters, effects of finite word length, and applications.

Pre-requisite: ECE 332

Designation: Elective

Course learning outcomes: Upon completion of this course, students should be able to do the following:

1. Describe and analyze discrete time signals in the time domain and frequency domain.
2. Apply digital signal processing techniques to analyze discrete time signals and systems.
3. Apply digital signal processing techniques to design discrete time systems.
4. Solve digital signal processing problems using Matlab.
5. Design and apply digital filters.

Student outcomes addressed: a, e, and k.

Topics covered:

Introduction; discrete time signals and systems - 3 hours

Sampling and reconstruction - 3 hours

Convolution - 3 hours

Discrete Time Fourier Transform – 3 hours

Discrete transforms; DFT, FFT - 5 hours

Z-transform and applications - 5 hours

Transform domain analysis of LTI systems - 3 hours

Finite impulse response digital filter design - 3 hours

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Digital signal processing applications - 3 hours

Tests and reviews - 3 hours