

Syllabus

ECE 512 – Digital Signal Processing – Fall 2020

Course Information

Course Title:	Digital Signal Processing
Course number:	ECE 512
Course discipline:	Electrical & Computer Engineering
Prerequisite(s):	ECE 312 or ECE 412
Class Time:	2:00 p.m. to 3:15 p.m. (Tuesdays & Thursdays)

Instructor Information

Name:	V. Chandrasekar
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Office location:	B117 Engineering
Office hours:	3:30 p.m. to 5:00 p.m.
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Textbooks

Required reading:	<i>Discrete Time Signal Processing</i> , A.V.Oppenheim and R.W. Schaffer, Prentice-Hall, 2010 (3 rd Edition)
Recommended reading:	<i>The Student Edition of Matlab</i> , The Math Works, Inc, Prentice-Hall, 1997
Recommended reading:	<i>Introduction to Digital Signal Processing</i> , J.Proakis & E. Manolakis, MacMillan, 2007 (4 th Edition)

Objectives

Course Goals:

This course will provide the student with an intuitive and practical understanding of the fundamental concepts of discrete-time signal processing. The intended audience include: All engineering and computer senior -level undergraduates of first-year graduate students; Students in related fields (music, geophysics, mathematics) which may require a technical understanding of the fundamentals used in digital signal processing; industry-based students requiring a foundation in discrete-time systems. The intention is to also provide the student with the necessary background for taking advanced level courses in signal and image processing, and ideally, for reading technical literature in DSP. Further, computer simulation exercises are intended to familiarize the student with implementation aspects and the application of theoretical knowledge to practical problems.

Course Outline

- I. Various signal and system representation and manipulations.
- II. Analysis of Linear Time Invariant Systems
- III. Multirate signal processing – sampling and interpolation.
- IV. Digital filter structure and design.
- V. The discrete Fourier transform and its computation via FFT
- VI. Analyses of signals using discrete Fourier transform.
- VII. Spectral Estimation.

Grading and Exams

Midterm Exams – 33 %

Homework & Projects – 33 %

Final Exam – 33 %