



EEE 5502/08H8 & EEL4750/226E

Fall 2016

Foundations of Digital Signal Processing

Syllabus

Instructor: Dr. Fred J. Taylor, Professor Emeritus, 441NEB
email fit@ece.ufl.edu (Subject line, EEE5502 or EEL4750)
Time and Place: MWF, 5th period (11:45-12:35), NEB202.
Textbook: PDF Notes on-line.
Canvas Web site: elearning.ufl.edu (browser sensitive).
TA: Benjamin Feldt (bfeldt@ufl.edu)

Abstract

The objective of the course is to provide a foundational understanding of digital signal processing (DSP) theory and practice as well as develop requisite analysis and synthesis skills. Studies will be conducted in both the time and frequency domains.

Topical Outline

Part I: Introduction to Discrete-Time Signals and Systems

- Introduction to DSP, linear systems, sampling, aliasing, quantization.

Part II: Discrete-Time Signal and System Representation

- z-transform, inverse z-transform.

Part III: Discrete-Time Fourier Transform

- Fourier transforms, discrete Fourier transforms (DFT), data windows, FFT.

Part IV: Linear Systems

- Convolution, system models, state-variable methods, digital filter architectures.

Part V: Introduction to Digital Filters

- Introduction to FIR and IIR filter design.

Part VII: Introduction to Multi-rate Systems

- Introduction to multi-rate systems.

Studio Format

Lessons begin with a review of the previous lesson's material in the form of a Challenge problem. Next, a lecture is presented that introduces new content followed by the presentation of a new Challenge problem.

Assessment (tentative)

Four (4) graded MATLAB enabled projects will be assigned to EEE5502 students.

Four (4) in-class hourly examinations (no final exam).

Tentative grade:

EEE5502: - (95%) Best 3 of 4 hourly exams + (5%) MATLAB Projects.

EEL4750: - (95%) Best 3 of 4 hourly exams + 5 points.

A **guaranteed** letter grade will be assigned before Exam #4 is taken. Accept the guaranteed grade or take Exam 4.

Resources

- PDF lesson material (on-line)
- PowerPoint in-class presentations. (on-line)
- Interesting Web site: www.ti.com (training, webcasts, etc.)
- Free trade newsletter (subscribe): <http://www.BDTI.com/dspinsider/dspinsider.html>
- MIT Open Courseware
- Calendar
- Supplemental textbooks:
 - Digital Signal Processing: A computer-Based Approach, Sanjit Mitra, McGraw Hill
 - Digital Filters: Principles and Applications, Fred Taylor, Wiley/IEEE
 - Hands-On Digital Signal Processing, Fred Taylor and Jon Mellott McGraw Hill