Digital Signal Processing

Department of Electrical Engineering
Southern Taiwan University of Technology
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Syllabus & Lecture Schedule

Course Objectives:
This course provides students with a basic understanding of Digital Signal Processing（DSP）including FIR and IIR systems. In addition, this course will introduce students to applications in audio and image processing problems as well as various engineering applications.

Textbook: Fundamentals of Digital Signal Processing, *Joyce Van de Vegte*, Prentice Hall, 2002.（ISBN 0-13-016077-6.）

Reference Books:
1. Signal Processing First, *McClellan, Schafer, and Yoder*, Pearson Prentice Hall, 2003.
2. Discrete-Time Signal Processing, *Oppenheim, Schafer, and Buck,* Pearson Prentice Hall, 1999.
3. Digital Signal Processing, Ver. 3, *Mitra,* McGraw-Hill, 2006.
4. Fundamentals of Digital Signal Processing Using Matlab, *Schilling and Harris*, THOMSON, 2005.

Prerequisites:
1. Working knowledge of differential equations and basic LTI sytem theory
2. Basic Matlab programming skills are recommended but not essential for the students taking this course.

Course Topics:
1. Crash Course in Digital Signal Processing
2. Analog-to-Digital and Digital-to-Analog Conversion
3. Digital Signals
4. Difference Equations and Filtering
5. Convolution and Filtering
6. Z Transforms
7. Fourier Transforms and Filter Shape
8. Digital Signal Spectra
9. Finite Impulse Response Filters
10. Infinite Impulse Response Filters
11. DFT and FFT Processing
12. Introduction to Audio Signal Processing
13. Introduction to Image Processing
14. Other Advanced Research Topics

Evaluation:
1. Homework …
2. Mid-term exam   OR   Mid-term project (in Matlab is preferred!)…
3. Final-term exam   OR   Paper Report (in Matlab is preferred!)…