DIGITAL SIGNAL PROCESSING I (EE 6360)
Spring 2000

Prerequisites:	EE 3202 (Signals and Systems) or equivalent
Credits:	3 Hours
Instructor:	Dr. Philip C. Loizou
Class Time:	Tuesday and Thursday 7:00-8:15pm /FN 2.102
Office Location:	EC 2.512
Office Hours:	Tuesday and Thursday 6:00-7:00 pm
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COURSE OBJECTIVE

To introduce the fundamentals of digital signal processing and related applications. This course will cover linear system analysis, z-transform, discrete Fourier transform (DFT) and its applications, FFT algorithms, digital filter (FIR and IIR) design and multi-rate signal processing.

TEXTBOOK

J. Proakis and D. Manolakis (1996). *Digital Signal Processing: Principles, Algorithms and Applications*, (3rd edition), Prentice Hall.

SOFTWARE TOOL

MATLAB 5.x (Mathworks, Inc., www.mathworks.com)

Optional book:

D. Hanselman and B. Littlefield (1998). *Mastering MATLAB 5: A comprehensive tutorial and reference*, Prentice Hall.

ASSIGNMENTS & GRADING

The course requirements consist of:

1. homework assignments from the book, and MATLAB computer assignments
2. one computer project
3. two in-class exams and one final exam (comprehensive).

Grading:

Homework & computer assignments	:	40%
Project	:	10%
Exams	:	30% (2x15)
Final Exam	:	20%

POLICIES

1. Homework may be turned in one class after it is due with a late penalty of 10%. Homework will not be accepted after the solutions are posted.
2. Make-up exams will not be given without advance notice to the instructor.

ACADEMIC DISHONESTY

Please see the UTD Graduate catalog for policy on academic dishonesty. Giving or receiving aid on a graded assignment or test is considered cheating and will be harshly penalized.

TENTATIVE SCHEDULE
EE 6360 - Spring 2000

Week	Date	Topic	Chapter
1	1/10	Continuous and discrete-time signals, intro to MATLAB	1.3
2	1/17	Analog-to-digital and D/A conversion, sampling theorem	1.4
3	1/24	Discrete-time signals, discrete-time systems, analysis of discrete-time LTI systems	2.1, 2.2, 2.3
4	1/31	Correlation of discrete-time signals, Z-transform	2.6, 3.1
5	2/7	Properties of the Z-transform, rational z-transforms	3.2, 3.3
6	2/14	Inversion of the Z-transform, analysis of LTI systems in the z-domain, **EXAM 1**	3.4, 3.6
7	2/21	Frequency-analysis of continuous-time signals, frequency analysis of discrete-time signals	4.1, 4.2
8	2/28	Properties of the Fourier transform for discrete-time signals, frequency-domain characteristics of LTI systems	4.3, 4.4
9	3/6	**SPRING BREAK**	
10	3/13	Frequency-domain sampling: The DFT, Properties of the DFT	5.1, 5.2
11	3/20	Linear-filtering methods based on the DFT, frequency analysis of signals using the DFT, efficient computation of the DFT: FFT algorithms	5.3, 5.4, 6.1
12	3/27	Design of digital filters, general considerations **EXAM 2**	4.5, 8.1
13	4/3	Design of FIR filters, design of IIR filters from analog filters	8.2, 8.3
14	4/10	Frequency transformations, design of filters based on least-squares method	8.4, 8.5
15	4/17	Structures for the realizations of discrete-time systems, structures for FIR systems, structures for IIR systems, Quantization and round-off effects in digital filters	7.1, 7.2, 7.3, 7.6, 7.7
16	4/24	Multi-rate digital signal processing: Decimation by a factor D, interpolation by a factor I, sampling rate conversion by a rational factor I/D	10.1, 10.2, 10.3, 10.4

FINAL EXAM: 6:30pm – 8:30pm, Thursday May 4, 2000