ECE-300 Signals and Systems
Winter 2007-2008

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Text: ***Signals and Systemss*** by Ziemer, Tranter, and Fannin, Fourth edition, Prentice-Hall, 1998.

GRADING POLICY

(3) Exams	12% each
Final Exam*	29%
Labs	10%
Lab Practical	10%
Homework	10%
Matlab/Prelab work	5%

Notes:

(1) In general, you must have a passing average (greater than or equal to 60%) on the exams to pass the class.

(2) While each exam (except the final) will focus on material since the previous exam, you are responsible for all previous material. *Anything covered from the beginning of class up until the time of an exam is fair game for the exam.*

(3) Homework assignments are ***due at the beginning of class on Tuesday.*** No late homework will be accepted without prior approval.

(4) You must acceptably complete each lab to pass the class.

(5) Prelabs will be part of your homework assignment. Each person is to do the prelab problems.

(6) You are expected to do your own work. You can certainly talk with each other and help each other, but the work you hand in should be your own. As an example, if two people hand in the same Matlab and both came from the same directory, neither will receive any points!

(7) Unless specifically told otherwise on a particular problem, you are expected to work out the problem by hand (or use Matlab).

**We will be having weekly quizzes on material that is basic to the understanding of the course material. The quizzes will occur in groups of two: the first quiz is the practice quiz covering the basic material, and the second quiz (occurring the next week) will be the quiz that counts. Your final exam will have a maximum score with no extra credit of 100%. If you score better than 90% on the second quiz you will be given an extra credit 1% on the final exam. Hence you have*

the ability to earn and extra 5% on the final exam. However, your final exam score will still only count for 29% of your total grade.

Labs:
A portion of your course grade is derived from your work in the laboratory exercises chosen to enhance the lecture material and your learning. You must want to participate to learn this material, and you will be rewarded for your work. **PASS**
NOTHING UP -- that is the only way to truly learn***. DO NOT*** let your lab partner do the work for you.

Your primary means of recording your work for the laboratory is by means of a worksheet or memo. Some labs will be done individually, some will be done with a lab partner.

1) Each lab is worth 10 points.

2) Labs are due at the end of your lab period.

3) Your grade in the laboratory is determined by your lab work and your lab practical.

5) You will only be allowed to bring your lab assignments and laptop to the lab practical-- it is to your advantage to keep well maintained lab worksheets and make sure any software used or developed in lab is on your laptop.

Course Objectives

After completing this course, the student shall be able to:

1. Represent a variety of signals and system responses both mathematically and graphically.
2. Appropriately characterize signals.
3. Appropriately characterize systems.
4. Determine the average power, DC value, and RMS value of a signal.
5. Perform convolution both analytically and graphically.
6. Determine and relate the impulse and step response of a system.
7. Represent a periodic signal by a Fourier series, and describe its frequency content from that representation.
8. Predict the output of a filter excited by an arbitrary periodic or aperiodic input waveform.
9. Represent a signal or an impulse response by a Fourier transform.
10. Use standard Fourier transform pairs and properties to simplify calculation of forward and inverse transforms of both energy and power signals.
11. Classify filters as lowpass, highpass, bandpass, or bandstop. Interpret lowpass and bandpass filter specifications, and understand the concept of distortion.
12. Find and sketch the time and frequency domain representations of a signal after sampling.

SYLLABUS

Class 1 (11/26) – Introduction
Class 2 (11/27) – Periodic functions
Lab 1 - Concept Inventory Exam, Introduction to Matlab
Class 3 (11/29) – Step, ramp, impulse functions

Class 4 (12/3) – Impulse functions
Class 5 (12/4) - Power and energy signals
Lab 2 - Matlab scripts and functions
Class 6 (12/6) - System properties

Class 7 (12/10) – System properties
Class 8 (12/11) – System properties
Lab 3 – Transistor Lab
Class 9 (12/13) – Impulse Response

Class 10 (12/17) – Convolution
Class 11 (12/18) – Convolution
Lab 4 – System impulse and step response
Class 12 (12/20) – **Exam 1**

Class 13 (1/7) – BIBO stability, Fourier Series
Class 14 (1/8) – Fourier Series
Lab 5 – Measurement of Fourier Coefficients
Class 15 (1/10) – Fourier Series

Class 16 (1/14) – Parseval's Theorem and line spectra
Class 17 (1/15) – Response of systems to periodic inputs
Lab 6 – Periodic signals as system inputs
Class 18 (1/17) – Fourier Transforms

Class 19 (1/21) – Fourier Transform properties
Class 20 (1/22) – Fourier Transform properties
Lab 7 – Signal Spectra
Class 21 (1/24) – **Exam 2**

Class 22 (1/28) – Fourier Transform Tables
Class 23 (1/29) – Response of systems to aperiodic inputs
Lab 8 – Audio Signals
Class 24 (1/31) – Response of systems to aperiodic inputs

Class 25 (2/4) – Analysis of ideal filters
Class 26 (2/5) – Real Filters
Lab 9 – Filter Design
Class 27 (2/7) – Sampling

Class 28 (2/11) – Sampling
Class 29 (2/12) - **Exam 3**
Lab 10 - Lab Practical
Class 30 (2/14) - Sampling