EE 383 Analytical Methods for Multivariable and Discrete Time Systems--Summer 2007

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Office Hours: Tuesday and Thursday 10:00-11:00, 3:00-4:00

Textbook: B. Lathi, *Signal Processing & Linear Systems*. Berkeley-Cambridge, 1998.

References:

H. Hsu, *Schaum's Outlines Signals and Systems*. McGraw-Hill, 1995.
A. Oppenheim and A. Willsky, *Signals & Systems 2nd ed*. Prentice Hall, 1997.
C. Phillips and J. Parr, *Signals, Systems, and Transforms, 2nd ed*. Prentice Hall, 1995.
R. Ziemer, W. Tranter, and D. Fannin, *Signals and Systems, Continuous and Discrete, 4th ed*. Prentice Hall, 1998.

Grades will be based on:

Homework: 15%
Quizzes: 20%
Midterm exam: 30%
Final exam: 35%

Schedule of topics:

- Discrete time signals and systems
- Discrete time convolution
- Sampling theory
- A/D and D/A converters
- Discrete time Fourier series
- Discrete time Fourier transform
- Discrete Fourier transform and the fast Fourier transform
- Z transform
- Finite impulse response (FIR) digital filters
- Infinite impulse response (IIR) digital filters
- Multivariable discrete time systems

Course objectives:

- Perform time-domain analysis of linear time-invariant systems; in particular determine the impulse response for discrete time systems and evaluate the convolution sum.
- Sample and quantize an analog signal to produce a digital signal and understand the sources of error that can arise from the A/D process.
- Represent discrete-time signals as a sum of complex exponentials.

- Develop the discrete Fourier transform and use it to approximate the Fourier transform of continuous time signals
- Analyze signals and LTI systems using z-transforms
- Implement basic FIR and IIR filters.

Attendance:

Advance notice will be given for class cancellations when possible. Students may leave after 15 minutes if no one shows up to teach a class. It is the responsibility of each student to make up deficiencies that result from missing classes. If an exam must be missed, the student must see the instructor and make arrangements in advance, unless an emergency makes this impossible. Approval for makeup exams is much more likely if the student is willing to take the exam early. A makeup exam will be different, and generally more difficult than the regular exam.

Prerequisites:

EE 382 Analytical Methods for Continuous Time Systems
The College of Engineering requires that a grade of C or better be earned in each course that serves as a prerequisite to any course applied toward completing the BSE degree requirements. If a grade of less than C is received in a course taken at UAH which is a prerequisite course, the course must be repeated and a grade of C or better earned BEFORE the student enrolls in the subsequent course.

Late homework will be accepted a maximum of twice during the semester but with a 10% deduction. Homework will not be accepted after solutions are available.

The Final exam is Friday, August 3 from 11:30AM-2:00 PM, and will be cumulative.

Class notes, homework assignments and solutions are located on the web at
http://www.ece.uah.edu/~ljoiner/ee383
Please email me if there are problems with the notes.