EE 414/514 Analog and Digital Filter Design
Fall 2009

Class Info: Meeting time: 5:30-6:50 Tuesday and Thursday
Location: Engineering Building 207

Instructor: Laurie Joiner
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Office Hours: Monday and Wednesday 2:00-3:00

Prerequisites: EE 383 Analytical Methods for Multivariable and Discrete Time Systems
EE 315 Introduction to Electronic Analysis and Design


Objectives: By the end of the semester you should be able to:
- Design analog filters using Butterworth, Chebyshev, and elliptical approximations
- Determine the filter frequency response
- Design active filters using operational amplifiers
- Design infinite impulse response digital filters
- Design finite impulse response digital filters

Topics: Review of signals and systems
Introduction to Filtering
Implementation of Analog Filters
Analog Filter Approximations
  - Butterworth approximations
  - Chebyshev approximations
  - Inverse Chebyshev approximations
  - Elliptic approximations
Implementation of Digital Filters
Infinite Impulse Response (IIR) Digital Filter Design
  - Impulse invariance
  - Bilinear transform design
Finite Impulse Response (FIR) Digital Filter Design
  - Windowing techniques to improve design
  - Frequency sampling
Grading:

- Homework / projects 20%
- Quizzes 15%
- Midterm exam 30%
- Final exam 35%

Final average of:
- 90 – 100  A
- 80-89  B
- 70-79  C
- 60-69  D
- < 60  F

Graduate Level:

Graduate students will perform an additional filter design. The design will include theoretical and simulation results.

Academic Honesty:

All work submitted for the tests and final must be your own unaided work. Collaboration on homework is permitted, but solutions must be your own.

Web Site:

A web site for this course will be maintained at http://www.ece.uah.edu/~ljoiner/ee414. Course handouts and all homework assignments will be posted to this page.

Final Exam:

The final exam is on Tuesday, December 8 from 6:30 pm-9:00 pm.