ECE 512
Filter Design

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Office hours: Monday 10-11:30 a.m.
Tuesday: 4:30-5:30 p.m.
and by appointment

Course Overview :

1) Fundamentals of continuous-time (analog) systems
2) Basic types of filters and different realizations (passive and active)
3) Passive and active realizations of simple filters:
   a) First order filters
   b) Second order filters

4) Frequency and impedance scaling (normalizations)
5) Filter transformation:
   a) lowpass to lowpass
   b) lowpass to highpass
   c) lowpass to bandpass
   d) lowpass to bandreject (notch)

6) Filter approximations:
   a- Magnitude response approximations:
      I. Butterworth filters
      II. Chebychev I and Chebychev II filters
      III. Elliptic filters
   b- Phase response approximation (Bessel-Thompson filters):
      I. Lowpass filters
      II. Allpass filters

7) Passive and active realizations of filters
8) An introduction to switching-capacitor filters
9) Sensitivity analysis
10) frequency limitations of the operational amplifier on filters

Textbook: Rolf Schaumann, Haiqiao Xiao, and Mac E. Van Valkenburg, "Design of Analog filters," Second edition, Oxford University Press, 2010.

references: 1) L. P. Huelsman and P. E. Allen, "Introduction to the theory and design of active filters," McGraw-Hill, 1980.

2) R. Schauman, M. S. Ghausi, and K. R. Laker, "Design of analog filters," Prentice-Hall, 1990.

Grading system:

First test	35%
Second test	35%
Project or term paper	30%
Total	100%

Tests and exams are open book and notes. **Honor Code** must be strictly observed

Homework: Solutions to the homework assignments will be available to students.