ELE 315: SIGNALS AND SYSTEMS (required)

Credit: 3 hours.

Catalog Description: Analysis of RLC circuits with applications to filters; Bode Plot; Fourier transforms, Laplace transforms, introduction to discrete time systems; 2-port network.

Prerequisites: ELE 210 with a grade of C or better and MAT 336.

Textbooks(s) and/or Other Required Materials: Continuous and Discrete Signals and Systems, S. S. Soliman and M. D. Srinath, 2nd edition, Prentice Hall, 1990.

Topics Covered:

Chapter 1 - Introduction Representing Signals (Sec. 1.1-1.7)
Chapter 2 - Continuous Time Systems (Sec. 2.1-2.5)
Chapter 3 - Fourier Series (Sec. 3.1-3.3, 3.5-3.7)
Chapter 4 - The Fourier Transform (Sec. 4.1-4.5)
Chapter 5 - Laplace Transform (Sec. 5.1-5.5, 5.9-5.10)
Chapter 6 - Discrete Time Systems (Sec. 6.1-6.6, 6.8)
Chapter 7 - Fourier Analysis of Discrete Time Systems (Sec. 7.1-7.5)
Chapter 8 - The Z Transform (Sec. 8.1-8.8)
Chapter 9 - The Discrete Fourier Transform (Sec. 9.1-9.5)
Chapter 10 - Design of Analog and Digital Systems (Sec. 10.1-10.4)

Class/Laboratory Schedule:

Lecture: 2.5 hours/week
Lab: none

Course Objectives and Relationship to Program Outcomes:

1. Addresses the fundamental concepts of signal processing (Outcome A, C, E, G, I, K).
2. Provides an in-depth treatment of time and frequency domain analysis (Outcome A, E).
3. Covers many DSP applications including algorithm implementation examples (Outcome A, C, E, I, K).
4. Involves synthesis/design of analog and digital filters (Outcome A, C, E, G, K).

This course will assist to provide a strong background in Signals and Systems entailing continuous time systems, Fourier Transform, Fourier Series, Discrete time systems, Discrete Fourier Transform, Z Transform with applications to design of continuous and discrete systems.

Team-based Design Projects: Teams consisting of 4-6 members randomly assigned with an identified team-leader will propose projects with a strong component in signals and systems. The proposed projects can be hardware or software in nature. Teams are expected to file their initial proposal, bi-weekly activities, and final project paper on a designated website. Each team-leader will serve as a main point of interface for the team. Inter-team collaborations and exchange of ideas are highly encouraged.
Coverage (and level) of ABET Outcomes:  A (3), C (2), E (3), G (3), I (3) and K (3).

Contribution of Course to meeting the Professional Component:
   Engineering Topics:  100%

Date: June 2004.