COURSE: EECS 216. TITLE: Introduction to Signals and Systems. PREREQUISITES: EECS 215; co-requisite Math 216


COURSE OBJECTIVES:
1. To acquaint students with the basic concepts and properties of continuous-time signals and systems;
2. To teach students how to use Fourier series, and Fourier and Laplace transforms for spectral analysis;
3. To teach students how to use transfer functions and frequency response to analyze and design filters;
4. To introduce students to, and stimulate interest in, communications, control and signal processing;
5. To prepare students for follow-up courses in the Systems area of the Electrical Engineering program.

COURSE OUTCOMES [Program Outcomes Addressed]
1. Ability to compute Fourier series, Fourier transforms, and Laplace transforms using integrals; [1,13]
2. Ability to compute transfer functions, poles & zeros, & frequency response for simple systems; [1,14]
3. Ability to compute zero-state & zero-input responses of a simple system & determine stability; [1,14]
4. Ability to analyze and design simple signal processing filters (lowpass, highpass, bandpass); [1,11,13]
5. Ability to analyze simple analog communications systems using DSB and SSB modulation; [1,11,13]
6. Ability to analyze simple feedback control systems, and to use feedback to alter its stability. [1,11,14]

PROGRAM OUTCOMES ADDRESSED: 1,11
PROFESSIONAL COMPONENT ADDRESSED: 13,14
PREPARED BY: Andrew E. Yagle on March 15, 2006

TOPICS COVERED:
1. System classification (LTI, etc.)
2. Impulse response & convolution
3. Fourier series and spectrum
4. Fourier transform and properties
5. Laplace transform and properties
6. Transfer functions, poles & zeros
7. Frequency response and filtering
8. s-plane RLC circuit analysis
9. Sampling theorem and the DFT
10. Applications in communication, signal processing, and control

ASSESSMENT (Course outcomes)
1. 10 problem sets [1,2,3,4,5,6]
2. Hardware & software labs [2,4,6]
3. 3 closed-book exams [1,2,3,4,5,6]

COURSE DESCRIPTION: University of Michigan, College of Engineering, ELECTRICAL ENGINEERING PROGRAM