EE 232-Signals and System (Required Course)

Code and Name: EE 232 Signals and System
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Signals Systems and Transforms, by C. L. Phillips, J. M. Parr and E. A. Riskin, Fifth Edition, Prentice Hall 2014.

Other References:
- Alan V. Oppenheim, signals and systems (2nd edition), Prentice Hall, 1997.
- B. P. Lathi, Signal Processing & Linear Systems, 2nd ed., Oxford University Press, 2005.
- D. McMahon, Signals and Systems Demystified, McGraw-Hill, 2007.
- L. Chaparro, Signals and Systems Using MATLAB With Online Testing, Academic Press, 2011.
- Hwei Hsu, Schaum's Outline of Signals and Systems, Second Edition, McGraw-Hill, 2010.
- R. Ziemer, W. Tranter, D. Fannin, Signals and Systems: Continuous and Discrete, 4th edition, Prentice Hall, 1998.

Course Description:
Classification of continuous- and discrete-time signals and systems. Linear time-invariant systems. Fourier series. Fourier transform. Laplace transform. Linear circuits and systems concepts. Impulse response. Convolution. Transfer function. Frequency response. Introduction to sampling of analog signals.

Pre-requisites: EE221.
Co-requisites: None.

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)
1. Identify different signals and categorize it into two types. (1)
2. Solve the singularity functions and use them in defining the signals for both continuous and discrete time domain signals. (1)
3. Analyze the different types of Time and Amplitude transformations for both continuous and discrete signals. (1)
4. Understand the Linear time invariant system requirements for continuous and discrete time domain signals. (1)
5. Solve problems using Fourier series technique and apply it to periodic signals. (1)
6. Identify the relation between continuous time domain and the continuous frequency domain by using fourier transform technique. (1)
7. Understand the sampling process. (1)

Topics to be covered:
- Introduction: Introduction to Signals and Systems.
- Continuous-Time Signals and Systems: Transformations, Signal Characteristics, Common Signals, Singularity Functions, Mathematical Functions for Signals, Continuous-Time Systems and Properties.
- Continuous-Time Linear Time-Invariant Systems
- Fourier Series
- Fourier Transform
- Application of Fourier Transform: Ideal Filters, Sampling.
- Laplace Transforms
- Discrete-Time Signals and Systems
- Discrete-Time Fourier transforms: Discrete Fourier Transform. Fast Fourier Transform.

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.