EE 4705: Digital Signal Processing

3 Credit Hours

Prerequisite: EE 3701

This course explores discrete signal processing including concepts of digital signal processing. Primary application domain targeted is speech signals although other signal types will also be considered, including vibration signals, music signals etc. We will cover core concepts of signal processing including classification of discrete-time systems, convolution and its application to LTI systems and analysis of LTI systems via the Z transform, Fourier transform, and Fourier series, Discrete Time Fourier Series and Transform, Discrete Fourier Transform and Fast Fourier Transform. This course will also explore applications like Filter Design and Systems Analysis. Software simulations will emphasize the applied components of the course using MATLAB / SIMULINK programming and perform project on Speech Processing. Students will also be participating in written and oral presentation.

EE 4706: Image Processing and Pattern Analysis

3 Credit Hours

Prerequisite: EE 2301

This course is designed to be an introductory course to the world of Computer Vision for the undergraduate electrical engineering students. It will introduce the students to two critical areas of Computer Vision, namely, Image Analysis and Pattern Analysis. The course will cover techniques and tools for digital image processing, and finally also introduce image pattern analysis techniques in the form of image segmentation and object tracking. The course is primarily meant to develop on-hand experience in applying these tools to process these images. Hence, the programming assignments form a key component of this course. Emphasis will be to develop engineering skills and intuitive understanding of the tools used in Image Processing and Pattern Analysis.