

ELEG 3124 – Signals and Systems

Credits and Contact Hours

Four credit hours, 45 hours of instructor contact

Instructor's Name

Jingxian Wu

Textbook

Luis F. Chaparro, Signals and Systems Using Matlab, Academic Press, 2010

a. Matlab

Specific Course Information

- a. Continuous signals and systems, linear system analysis, convolution, Laplace transform, Fourier series, Fourier transform.
- b. Pre-requisites: ELEG 2104 or ELEG 3903 or BMEG 2904. Pre- or Co-requisites: MATH 2584. Co-requisite: Lab component
- c. Required

Specific Goals for the Course

1. Specific outcomes of instructions
 - (a) Students will be able to perform time-domain analysis of signals and systems.
 - (b) Students will be able to perform frequency domain analysis of signals and systems through Fourier series and Fourier transform.
 - (c) Students will be able to represent and analyze signals and systems through Laplace transform.
2. Indicate the student outcomes listed in Criterion 3 addressed by the course
 - (a) Students are required to apply knowledge of mathematics (e.g. integrations, differentiations, differential equations, algebra, and complex number operations), physics (e.g. energy, power), and electrical engineering (e.g. electrical circuits) in analyzing signals and linear time-invariant systems in the time and transform domains.
 - (b) Students are required to design experiments related to signal processing in the time and transform domains, and to analyze the response of the linear time-invariant systems.
 - (c) Students are required to design linear time-invariant systems to process audio signals during the lab components.
 - (e) Students are required to solve engineering problems related to signals and linear time-invariant systems.
 - (k) Students are required to master the basic skills of Matlab, and use the skills to solve problems related to signals and systems.

List of Topics Covered in Class (class time: 75 minutes)

1. Continuous-time signals (4 class)
2. Continuous-time systems (6 classes)
3. Fourier Series (6 classes)
4. Fourier Transform (8 classes)

5. Laplace Transform (8 classes)

List of Topics Covered in Lab (lab time: 170 minutes)

1. Introduction to Matlab 1
2. Introduction to Matlab 2
3. Continuous-Time Signal
4. Linear System
5. Fourier Series
6. Fourier Transform