

ECE 3303: Linear System Analysis

Credit / Contact hours: 3 / 3

Course coordinator: Ayrton Bernussi

Textbook(s) and/or other required material: B. P. Lathi, Linear Systems and Signals, second edition, Oxford University Press, 2005. (ISBN: 978-0-19-515833-5)

Catalog description: Concepts of signal and system analysis in time and frequency domains as applied to electric circuits. Laplace transform, Fourier series, and Fourier transform techniques are stressed.

Pre-requisites: ECE 1304, ECE 3302; **co-requisite:** MATH 3350.

Designation: Required

Course learning outcomes: Upon completion of this course, students should be able to do the following:

1. Solve problems involving continuous-time signals and linear systems.
2. Solve problems involving discrete-time signals and linear systems.
3. Use the Fourier series and transform to analyze signals and linear systems.
4. Use the Laplace Transform to analyze signals, linear circuits, and systems.

ABET Student Outcomes addressed: a, e, and k.

Topics covered

Continuous-time signals and systems - 4 hours.

Fourier series and Fourier transform with applications in circuits and communications (e.g. filters, frequency response, sampling, and modulation) - 12 hours.

Laplace transform with application in circuits and controls - 8 hours.

Discrete-time signals and systems - 4 hours.

Convolution for continuous-time and discrete-time systems - 4 hours.

Discrete-time Fourier transform - 6 hours.

Tests and reviews - 4 hours.