

ECE 3050 (Proposed): Signals and Systems

Course Description

Linear systems and models in continuous and discrete time; convolution; Fourier series and transform; frequency response; Laplace transform; z-transform; applications.

Prior Course Number: 352

Transcript Abbreviation: Signals & Systems

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad

Student Ranks: Junior, Senior

Course Offerings: Autumn, Spring

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 2020, 2050, and 2060; or 2100; and Math 2568 (568) or 571; and prereq or concur Math 2415; and enrollment in ECE or EngPhysics major.

Exclusions: Not open to students with credit for 352.

Cross-Listings:

Course Rationale: Existing course.

The course is required for this unit's degrees, majors, and/or minors: Yes

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.1001

Subsidy Level: Baccalaureate Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Be competent with linear systems as approximate models of physical systems
Master convolution for discrete-time and continuous-time linear systems
Master Fourier series, Fourier transform, and discrete-time Fourier transform
Master frequency response concepts

Master using Laplace transform techniques for solving linear differential equations
Be competent in the use of Z-transform techniques for solving linear difference equations
Be exposed to the applications of signal and systems concepts.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Modeling signals and systems	3.0							
LTI properties in time domain; stability	2.0							
Convolution: computation in discrete and continuous time	4.0							
Fourier series	4.0							
Fourier transforms	3.0							
Discrete-time Fourier transform	4.0							
Frequency response, Bode plots, and filters	3.0							
Sampling	2.0							
Laplace transform; solving ODEs; stability	5.0							
Z-transform	4.0							
Applications (e.g., system identification, tracking, stabilizing feedback, quadrature modulation)	3.0							
Reviews	3.0							

Representative Assignments

Textbook problems
Computed examples on measured signals using Matlab
Applications project

Grades

Aspect	Percent
Midterm exam 1	20%
Midterm exam 2	20%
Homework	15%
Projects	10%
Final exam	35%

Representative Textbooks and Other Course Materials

Title	Author
<i>Signals and Systems</i>	Oppenheim and Willsky

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	a	An ability to apply knowledge of mathematics, science, and engineering.
*	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
*	c	An ability to design a system, component, or process to meet desired needs.

Course Contribution		College Outcome
	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
	f	An understanding of professional and ethical responsibility.
*	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Additional Notes or Comments

Updated prereq to be consistent with university format.

Changed text from Fundamentals of Signals and Systems Using MATLAB, 3rd by Kamen and Heck 4/2/12

<ake consistent with OSU version 2/13/14

Added "or 292 or 294 (Spring 2011) " to prereqs 4/11/12

Added transfer courses to prereq 10/30/12

Added " ; or prereq or concurrent 2010 and permission of department." to prereqs 10/20/13

Update course description, add Math 2415 as rereq or conch, course goals expanded, course topics updated, make "projects" plural under grades. April 5, 2014 (result of ABET internal review)

Update prereqs to include new sophomore courses 9.11/15 BLA

Update prereqs again Update goals, topics, stars. 6/16/16 BLA

Edited text info, 5/10/17, CED

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