
EE 1110 Essential Mathematics for Electrical Engineering

Curricular Designation: EE: required CpE: required

Catalog Description:

EE 1110 Essential Mathematics for Electrical Engineering. Review of basic trigonometry, sinusoidal signals, amplitude, frequency, and phase, addition of sinusoids. Complex numbers and complex arithmetic. Real exponential functions, complex exponentials, Euler's relations, decaying sinusoids and complex exponential functions. Differentiation and integration of sinusoids and exponentials.

Credits: 1.0 Lec-Rec-Lab: (1-0-0) *Semesters Offered:* Fall, Spring, Summer. *Restrictions:* Must be enrolled in one of the following Major(s): Electrical Engineering, Software Engineering, Computer Engineering, Electrical Engineering Technology, Engineering Undeclared; Must be enrolled in one of the following Class(es): Freshman, Sophomore

Textbooks(s) and/or Other Required Materials:

1. Course notes provided by instructor.

Prerequisites by Topic:

1. Differential calculus

Course Objectives:

1. To ensure the EE and CpE students are firmly grounded in the essential mathematical tools that are indispensable in circuit theory, power systems, signal processing, communications, and control theory. This material is part of everyday practice for electrical engineers, and should be committed to memory. Students will demonstrate their mastery of the material through a single closed-book exam.

Topics Covered:

1. Sinusoids and their parameters
2. Real logarithms and exponentials
3. Complex numbers and complex arithmetic
4. Euler's formula and its application
5. Complex exponential functions
6. Phasors and the addition of sinusoids
7. Differentiation of sinusoids, real exponentials, and complex exponentials
8. Integration of sinusoids, real exponentials, and complex exponentials

Relationship of the Course Content to Program Outcomes:

	Outcome	Topics and Level of Coverage		
		Important	Moderately Important	Minimally Important
a	an ability to apply knowledge of mathematics, science and engineering	x		
b	an ability to design and conduct experiments, as well as to analyze and interpret data			x
c	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability and sustainability			x
d	an ability to function on multi-disciplinary teams			x
e	an ability to identify, formulate and solve engineering problems	x		
f	an understanding of professional and ethical responsibility	x		
g	an ability to communicate effectively			x
h	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context			x
i	a recognition of the need for, and an ability to engage in life-long learning			x
j	a knowledge of contemporary issues			x
k	the ability to use the techniques, skills, and modern engineering tools necessary for the practice of electrical engineering	x		

Contribution of Course to Meeting Degree Requirements:

1.0 Credit Hour – Math/Basic Science

Class/Laboratory Schedule (note: 1 hour = 50 minutes):

Lecture: 14 hours = 2 hours/week for 7 weeks

Help Sessions: 7 hours = 1 hour/week for 7 weeks (optional)

Prepared by:

Daniel R. Fuhrmann, Dave House Professor and Chair, December 2, 2016