EE 302 PROBABILISTIC METHODS IN ELECTRICAL AND COMPUTER ENGINEERING

Offered Fall, Spring. Lecture Hrs: 3. Total Credits: 3.

Prerequisites: MA 262 or MA 266

Corequisites: EE 301

Prerequisites By Topic:

basic calculus skills; differential equations; familiarity with basic concepts of circuits and linear system analysis, such as convolution; familiarity with Fourier analysis and two-sided transforms used in solving linear systems and differential equations

Engineering Science Credits: 3.0

Engineering Design Credits: 0.0

Course Description:

An introductory treatment of probability theory including distribution and density functions, moments and random variables. Applications of normal and exponential distributions. Estimation of means, variances. Correlation and spectral density functions. Random processes and response of linear systems to random inputs.

Required Text(s):

Probability and Random Processes for Electrical Engineering, 2nd edition, Alberto Leon-Garcia, Addison-Wesley, 1993, ISBN No: 0-201-50037-X.

[redacted]

Outcomes:

A student who successfully fulfills the course requirements will have demonstrated:

i. an ability to solve simple probability problems in electrical and computer engineering applications [1,2,4;a,b,e]

ii. an ability to model complex families of signals by means of random processes [1,2,3,4;a,b,e,k]

iii. an ability to determine the random process model for the output of a linear system when the system and input random process models are known [1,3,4;a,b,e,k]

Lecture Outline:

Week	*Topic*
1	Introduction, Definitions; Set Operations; Probability Introduced
2	Probability Axioms; Math Model; Joint & Conditional Probability
3	Independence, Bernoulli Trials; Ran. Variables and Distribution Functions; Density Functions
4	Gaussian Random Variables; Other Density Functions; Conditional Probability
5	Expectation; Moments; Transformations of a Random Variables
6	[redacted] Vector Random Variables
7	Joint Distribution & Density; Conditional Distributions, Independence; Sums of Random Variables
8	Random Processes; Correlation Functions
9	Process Measurements; Gaussian, Poisson Processes
10	[redacted]; Spectral Density
11	Relationship to Correlation Function; Some Noise Definitions; Linear System Fundamentals
12	Random Signals and Linear Systems
	Review