The University of Texas at Tyler
Department of Electrical Engineering

EENG 5307: Intro. to Random Processes

Syllabus

Catalog Description:

Introduction to random processes, transformation of random variables, correlation function and power spectral density, system response to noise, optimal processing.

Prerequisites: EENG 4311

Credits: (3 hours lecture, 0 hours laboratory per week)

Text(s): Intuitive Probability and Random Processes using MATLAB by Steven Kay, ISBN: 9780387241579

Additional Material: MATLAB, Class Notes

Course Coordinator: Ali Ghorshi, PhD

Topics Covered: (paragraph of topics separated by semicolons)

Random Variables Review; Functions of Random Variables; Expectation and Estimation; Random Vectors and Parameter Estimation; Random Sequences; Random Processes

Evaluation Methods: (only items in dark print apply):

1. **Examinations / Quizzes**
2. **Homework**
3. Report
4. **Computer Programming**
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Outcomes[1]: By the end of this course students will be able to:

1. Make use of random variables to solve engineering problems [1,2,4]
2. Make use of random vectors to solve engineering problems[1,2,4]
3. Make use of random sequences to solve engineering problems[1,2,4]
4. Model engineering problems using random process [1,2,4]
5. Analyze the response of linear systems to random inputs[1,2,4]
6. Analyze power spectral densities [1,2,4]
7. Simulate the response of linear systems to random inputs and random process. [1,2,4]

[1] *Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Student Outcomes [2]: This course supports the following Electrical Engineering Student Outcomes, which state that our students will possess:

1. Breadth and Depth: Students will be able to apply knowledge at a graduate level in two of the following areas: electronics, power systems, controls, advanced engineering mathematics, signal processing. [1,2,3]
2. Modern Engineering Tools: Students will be able to use modern engineering tools for analysis and design as applied to engineering problems. [4]
3. Advanced Engineering Mathematics: Students will be able to apply principles of advanced engineering mathematics including probability and statistics to engineering problems. [5,6]
4. Systems Design: Students will be able to apply systems design approaches including modeling and simulation of interacting sub-systems to complex engineering problems. [7]
5. Design Methods: Students will be able to demonstrate application of design methodology by comparing and evaluating solutions to engineering problems.
6. Communication Skills: Students will demonstrate effective oral, visual and written communication skills from a technical perspective.

[2] *Numbers in brackets refer to course learning outcome(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

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