Course: EENG 4311 – Signals and Systems

Syllabus

Catalog Description:
Types of signals; types of systems; properties of systems; convolution; Fourier series, Fourier transforms; Laplace transforms; Difference equations; Z-transform; Discrete-time systems; applications and design concepts.

Prerequisites:  
EENG 3305 Linear Circuits Analysis II, EENG 2101 Matlab for Engineers

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

Text(s):  B. P. Lathi, Linear Systems and Signals, 2nd edition, Oxford, 2005

Additional Material:  Class Notes

Course Coordinator:  David Hoe, Assistant Professor, Electrical Engineering

Topics Covered:  Signal and System Modeling; Time domain modeling of systems; Fourier Series; Fourier Transform and its applications; The Laplace Transform; Applications of the Laplace Transform; Z-Transform

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 Objectives1:
1. Model linear systems and composite signals [1,2,4]
2. Model systems using time domain techniques [1,2,4]
3. Apply the Fourier Series to signals [1,2,4]
4. Apply the Fourier Transform to signals [1,2,4]
5. Use the Laplace Transform to model systems [1,2,4]
6. Identify applications of the Laplace Transform [1,2,4]
7. Analyze Discrete Time Signals and Systems [1,2,4]

1Numbers in brackets refer to method(s) used to evaluate the course objective.
Relationship to Program Outcomes (only items in dark print apply): This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering; [1-5, 7]
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering; [1-7]
3. have the ability to analyze electrical circuits, devices, and systems; [1-7]
4. have the ability to design electrical circuits, devices, and systems to meet application requirements; [2, 5, 6]
5. have the ability to design and conduct experiments, and analyze and interpret experimental results; [4, 6]
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods; [1-7]
7. have effective written, visual, and oral communication skills;
8. possess an educational background to understand the global context in which engineering is practiced, including:
   a. knowledge of contemporary issues related to science and engineering;
   b. the impact of engineering on society;
   c. the role of ethics in the practice of engineering;
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers;

*Numbers in brackets refer to course objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

| Mathematics and Basic Sciences: | 0 hours |
| Engineering Sciences and Design: | 3 hours |
| General Education Component: | 0 hours |

Prepared By: R. Hippenstiel  
Modified By: Hector A. Ochoa  
David Hoe  
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