Faculty of Eng. & Natural Sci.

EE311-202301
Introduction to Signal Processing and Information Systems

Instructor(s)

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<tr>
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<th>Email</th>
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<th>Office Hours</th>
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Course Content


Objectives

To provide a broad introduction to signal processing and information systems, following upon basic signals and systems knowledge. To provide exposure to basics and selected topics in communication, control, and random signals, with links to practical applications.

Recommend or Required Reading

Textbook


Readings

Introduction to Stochastic Signal Processing by I.Young and R. Ligtering (online)
Assessment Methods and Criteria

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<th>Percentage(%)</th>
<th>Number of assessment methods</th>
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<tr>
<td>Final</td>
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<td>Quiz</td>
<td>60</td>
<td>6</td>
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<tr>
<td>Individual Project</td>
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Course Outline

Overview of Signals and Systems basics.

Deterministic Signals
- Continuous-time Fourier Series
- Continuous-time Fourier Transform
- Laplace Transform
- Unified understanding of signal processing, communications, and control (a systems perspective)
- Sampling and relationship between continuous- and discrete- transforms

Random Signals
- Review of Probability Theory and Statistics
- Inference/ Estimation of continuous random signals
- Hypothesis Testing, Neyman Pearson criterion
- Wiener filter

Learning Outcomes

- discuss the fundamental concepts in signal processing and information systems,
- exhibit and express a unified view of problems in communication, control, and signal processing,
- describe the process of input-output characterization of linear time invariant systems,
- correctly perform calculations involving transforms including continuous and discrete-time Fourier transforms, as well as Laplace and z-transforms,
- perform computer simulations demonstrating main concepts in signal processing including sampling, transforms, and modulation.

Course Policies

Proficiency in MATH203 is expected. The second half of the course deals with random variables and processes.

We will have bi-weekly exams. In total, 5-6 exams will be administered during recitation hours. The exam duration will be 15-30
minutes, depending on the difficulty of the exam questions. The week before the exam, there will be a homework assignment. The exam questions will be related to the assignment. A final comprehensive exam will be given at the end of the semester.

There will be one programming assignment, which will be completed in multiple phases. TA will give a brief tutorial at the beginning of the semester and always be available for your computer-related questions. You will prepare a final report of your findings in this programming assignment.