Course: ENPM 603 – Theory and Applications of Digital Signal Processing  
Semester: Fall 2015  
Day(s): Wednesday  
Time: 7:00 – 9:40 pm  
Location: JMP 3201 (DETS)  
Instructor: Emre Gunduzhan  
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Email: egunduzhan@hotmail.com

Course Description

The course intends to teach analysis and design methods for discrete-time signals and systems. More specifically, the course covers the sampling theorem, the Z-transform and discrete-time system analysis, multi-rate systems, discrete-time random processes, methods for designing FIR and IIR digital filters, effects of quantization and finite work-length, the DFT and FFT, and power spectrum estimation.

ENEE 322 (Signal and System Theory) or an equivalent course is pre-requisite.

The textbook (see below) is required. There will be some assignments from the book, therefore the students should have the correct edition. Class notes, homework solutions, and exam solutions will be available from the ELMS site for the course. The site will also be used for announcements and discussions of various topics.

MATLAB will be used for the course project and some homeworks. The students are expected to learn and use basic MATLAB skills during the semester. Previous knowledge of MATLAB would be helpful but it is not necessary.

The grading will be based on homeworks/projects (30%), one midterm exam (30%), and one final exam (40%). Both the midterm and the final exam will be in class during regular lecture hours (see schedule below for specific dates).

Required/Recommended Textbooks


Course Outline

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<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>September 2</td>
<td>Introduction, signals and systems (Chapter 2)</td>
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<td>September 9</td>
<td>LTI systems, Fourier transform, random sequences (Chapter 2)</td>
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<td>September 16</td>
<td>Z-transform, region of convergence, inverse z-transform (Chapter 3)</td>
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<td>September 23</td>
<td>Sampling (Chapter 4)</td>
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<td>September 30</td>
<td>Multirate signal processing (Chapter 4)</td>
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<td>October 7</td>
<td>Analysis of LTI systems (Chapter 5)</td>
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October 14  Analysis of LTI systems (Chapter 5)
October 21  Block diagram representations, finite-precision implementation effects (Chapter 6), review
October 28  Mid-term exam
November 4  Filter design (Chapter 7),
November 11 DFT (Chapter 8)
November 18 FFT (Chapter 9)
November 25 Spectral analysis (Chapter 10)
December 2  Analysis of random signals and parametric modeling (Chapters 10 & 11)
December 9  Advanced DSP applications (time permitting), review
December 16 Final exam

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The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit http://shc.umd.edu/SHC/HonorPledgeInformation.aspx.