BME 1452: Signal Processing - Fall 2015

A course targeted towards engineering students collecting experimental data in graduate-level research projects.

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2/ Lecture Times:  Wednesday, 3:00 – 5:00 PM

3/ Lecture Location:  MC306 (formerly MC310)

4/ Course Organization:  The course will be divided into two main modules:

   a) Analysis of systems (Lectures 1-6)
   b) Random signals, Power Spectra, filtering and adaptive systems (Lectures 7-13).

6/ Grading Scheme:  
   a) Assignments – 10%
   b) Midterm – 20% (Held during first half of lecture 7)
   c) Term project – 30%
   d) Final exam – 40%

Course web-site:  http://www.mie.utoronto.ca/ftp/guest2
username: asguest2
password: B8101
### Detailed Lecture Schedule and Topics (subject to modification):

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Instructor</th>
<th>Reference</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept 16</td>
<td>Sinclair</td>
<td>Oppenheim chapters 1,2; Hsu chapters 1,2; Hayes chapter 1.</td>
<td>Overview of systems (Biomedical/mechanical), key components, signal characteristics. Continuous and discrete-time signals. Frequency content. Linear time-invariant systems. Linear constant-coefficient differential equations, delta functions. Impulse response. Signal convolution. Definition of Fourier Transform.</td>
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<td>4</td>
<td>Oct 7</td>
<td>Sinclair</td>
<td>Hayes chap’s 2-7; Hsu chap’s 3-6</td>
<td>Noisy signals. auto-correlation and cross-correlation functions. signal chirps. analytic signal. Applications.</td>
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<td>5</td>
<td>Oct 14</td>
<td>Sinclair</td>
<td>Hayes chap’s 2-7; Hsu chap’s 3-6</td>
<td>Mid –Term (first half of lecture period). It will be based only on lectures delivered by Sinclair up to October 21. (1 hour)</td>
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<tr>
<td>6</td>
<td>Oct 21</td>
<td>Sinclair</td>
<td>Hayes chap’s 2-7; Hsu chap’s 3-6</td>
<td>Term Projects</td>
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<tr>
<td>7a</td>
<td>Oct 28</td>
<td>Sinclair</td>
<td>Hayes chap’s 2-7; Hsu chap’s 3-6</td>
<td>Papoulis &amp; Pillai Probability, RV and Stochastic Processes</td>
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<td>11</td>
<td>Nov 25</td>
<td>Eizenman</td>
<td>Papoulis &amp; Pillai Probability, RV and Stochastic Processes</td>
<td>Final exam</td>
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</table>
8/ Reference Materials:

   ISBN 0-13-814757-4
   This text is available from Amazon, and there are a few copies placed on reserve in the engineering library. The first edition of this text is organized slightly differently, but has primarily the same material.


