ENG EC401: Signals and Systems

2008-2009 Catalog Data:

Class/Lab Schedule:
LEC: 4 hrs/wk, LAB:1 hr/wk

Textbooks and other required materials:

Coordinator:
Jeffrey Carruthers, Associate Professor, ECE Department

Prerequisites by topic:

Goals:
To provide students with:
- Complete understanding of the nature of continuous and discrete signals and their applications in engineering systems.
- Knowledge of the terminology of and concepts of both analog and digital signals and systems.
- Experience in the characterization of signals
- Understanding of and experience in the use of transforms for signal classification and analysis.
- Experience in signal processing and system analysis using Matlab

Course Outcomes:
As an outcome of completing this course, students should be able to:
1) Understand the terminology of signals and basic engineering systems.
2) Understand the role of signals and systems in engineering design and society.
3) Understand the use of signals and basic system building blocks and their roles in large/complex system design.
4) Understand signal representation techniques and signal characteristics.
5) Understand the difference and the applications of analog versus discrete signals and the conversion between them.
6) Understand the process of sampling and the effects of undersampling.
7) Understand the Fourier, Laplace and z-transforms.
8) Understand the use of transforms in signal/system analysis, characterization, and manipulation.
9) *Understand* the relations between the Fourier, Laplace and z-transforms.
10) *Understand and design* basic feedback systems.
11) *Perform* group work in system analysis and design.
12) *Write* clear and cohesive reports on laboratory experiments and team design exercises.
13) *Communicate* the primary concepts of signals and systems effectively to team members, instructors and others.
14) *Design* and perform Matlab experiments to verify concepts.

**Course Outcomes mapped to Program Outcomes:**

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<th>Program Outcomes</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<tbody>
<tr>
<td>Course Outcomes</td>
<td>1,3-9</td>
<td>10-12,14</td>
<td>10-11</td>
<td>10</td>
<td>1,3-9</td>
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<td>12-13</td>
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<td>8-11</td>
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<td>10-12,14</td>
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**Contribution of Course to Meeting the Professional Component:**
Engineering topics: 100%

**Prepared by:** Jeffrey Carruthers, Associate Professor  
**Date:** Jun 22, 2009