Class Schedule - Spring 2011

Electrical and Computer Engineering

ECE 498  **Special Topics in ECE**  credit: 0 TO 4 hours.
Subject offerings of new and developing areas of knowledge in electrical and computer engineering intended to augment the existing curriculum. See Class Schedule or departmental course information for topics and prerequisites. May be repeated in the same or separate terms if topics vary.

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>55132</td>
<td>Lecture-Discussion</td>
<td>DJ</td>
<td>10:00 AM - 10:50 AM</td>
<td>MWF</td>
<td>106B3 - Engineering Hall</td>
<td>Jones, D</td>
</tr>
</tbody>
</table>

Credit Hours: 4 hours
Not intended for students in the Electrical & Computer Eng department.
Topic: Principles of Signal Analysis. Prerequisites: Integral and differential calculus; introductory probability or statistics course; some familiarity with linear algebra; graduate standing in biological, physical, or social sciences. Credit will not be given to engineering students. An advanced introduction to signal analysis and processing methods for graduate students in the biological, physical, and social sciences. The course will develop a sophisticated understanding of signal analysis methods and their capabilities, weaknesses, and artifacts with an emphasis on their practical application. Significant hands-on processing and interpretation of real biological data using Matlab will be performed, thus requiring a graduate-level sophistication in a related application domain.

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<th>Instructor</th>
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<tbody>
<tr>
<td>55555</td>
<td>Discussion/Recitation</td>
<td>DJD</td>
<td>11:00 AM - 11:50 AM</td>
<td>F</td>
<td>204 - Transportation Building</td>
<td>Jones, D</td>
</tr>
</tbody>
</table>

Not intended for students in the Electrical & Computer Eng department.

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<tbody>
<tr>
<td>55697</td>
<td>Laboratory</td>
<td>HP</td>
<td>ARRANGED -</td>
<td>-</td>
<td>-</td>
<td>Hu, Y Polychronopoulos, C</td>
</tr>
<tr>
<td></td>
<td>Packaged Section</td>
<td>HP</td>
<td>03:00 PM - 04:20 PM</td>
<td>MW</td>
<td>1302 - Siebel Center for Comp Sci</td>
<td>Hu, Y Polychronopoulos, C</td>
</tr>
</tbody>
</table>

Credit Hours: 4 hours
Topic: Extending Mobile Computing Through Cloud Computing. Prerequisites: One of ECE 391, ECE 428, ECE 438, CS 242, or equivalent. This is a project course in which students design around the fundamental limitations of mobile computing devices, focusing on the network-connected smartphone. Existing smartphone processors have limited computational abilities and battery power, yet users are increasingly expecting full desktop-style application functionality. Recent advances in cloud computing help create a solution to this apparent impossibility, by harnessing the computing power of the cloud and the portable convenience of the mobile device. This course will look at the design, architecture, and engineering of cloud-reliant applications on mobile devices.

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<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>55005</td>
<td>Lecture</td>
<td>JJM</td>
<td>10:00 AM - 10:50 AM</td>
<td>MWF</td>
<td>106B6 - Engineering Hall</td>
<td>Makela, J</td>
</tr>
</tbody>
</table>

Credit Hours: 3 hours
Topic: Global Navigation Satellite Systems. Prerequisites: ECE 329. An introduction to global navigation satellite systems, with a focus on the global positioning system (GPS). Other systems, such as the European Galileo system and the Russian GLONASS system, will also be discussed. This course uses GPS as a case study for performing an end-to-end analysis of a complex engineering system. Topics to be covered in lectures and laboratories include basics of navigation, mathematics of obtaining a navigation solution, receiver design and analysis, error analysis and error mitigation. Laboratories will focus on understanding receiver design and developing a Matlab-based GPS receiver.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
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<th>Time</th>
<th>Day</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>55125</td>
<td>Laboratory</td>
<td>JM1</td>
<td>02:30 PM - 05:00 PM</td>
<td>W</td>
<td>251 - Everitt Laboratory</td>
<td>Makela, J</td>
</tr>
<tr>
<td>55126</td>
<td>Laboratory</td>
<td>JM2</td>
<td>02:30 PM - 05:00 PM</td>
<td>R</td>
<td>251 - Everitt Laboratory</td>
<td>Makela, J</td>
</tr>
<tr>
<td>51167</td>
<td>Laboratory</td>
<td>SL</td>
<td>ARRANGED -</td>
<td>-</td>
<td>-</td>
<td>Lumetta, S</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>SL</td>
<td>11:00 AM - 12:20 PM</td>
<td>TR</td>
<td>1214 - Siebel Center for Comp Sci</td>
<td>Lumetta, S</td>
</tr>
</tbody>
</table>

Credit Hours: 4 hours
Topic: Engineering Software Systems. Prerequisites: ECE 391. The class explores the evolution of programming languages as an engineering process and examines the challenges that face the hardware and software industries with increasing numbers of processors on a chip in order to prepare students to understand and contribute to future language evolution. Students will learn how relationships between language, compiler, runtime, and architecture are used to provide a coherent context in which software developers can reason about correctness and performance, and will gain firsthand experience with tools and techniques through programming assignments. Using the development of C++ as a focal point, the course first examines the expression and implementation of abstractions such as access control, inheritance, templates, and exception handling, identifying both the advantages and the potential pitfalls of these tools. The course continues with an overview of the challenges posed by parallelism, how the high-performance computing community has tried to address those challenges, why many of the solutions have not been adopted by the broader industry, and the relationship with current offerings for desktop parallelism.