## Tentative Course Syllabus

Syllabus subject to change. Note that there are 2 alternate dates listed at the end of the class, in case of cancellations on the original dates.

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Lecture material covered</th>
<th>Assignments</th>
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</thead>
</table>
| 1  | 10/11/05 | • Introduction to logistics of the class  
• Problem sets, exams, alternate dates, book errata  
• Introduction to power and signal processing concepts  
• Fundamentals  
• Power, phasers, 3-phase circuits, power factor  
• Magnetic circuits  
• Magnetic materials  
• Permanent magnets  
• Some design examples using finite-element analysis  
• Experiment: electrodynamic levitation  | • PS#1 handed out  
• Fitzgerald, Chapter 1 |
| 2,3| 10/18/05, 10/25/05 | • Transformers  
• Power transformers  
• Current transformers  
• Signal transformers, pulse transformers  
• Equivalent circuits and approximations  
• 3-phase transformers  
• The per-unit system  | • Fitzgerald, Chapter 2  
• PS#1 due  
• PS#2 handed out  
• PS3 |
| 4  | 11/1/05  | • Electromechanical energy conversion  
• Force and torques in magnetic systems  
• Energy and coenergy  
• Multiply-excited machines  
• Dynamic equations  | • Fitzgerald, Chapter 3  
• PS#3 due |
| 5  | 11/8/05  | • Introduction to rotating machines  
• Introduction to DC machines  
• Introduction to AC machines  
• Magnetic fields in rotating machines  
• Linear machines  | • Fitzgerald, Chapter 4  
• PS#4 |
| 6  | 11/15/05 | • Synchronous machines  
• Equivalent circuits  
• Open and short-circuit characteristics  
• Steady-state operating characteristics  
• **EXAM #1**  | • Fitzgerald, Chapter 5  
• PS#5 due |
| 7  | 11/22/05 | • Polyphase induction machines  
• Slip  
• Equivalent circuit  
• Torque and power  | • Fitzgerald, Chapter 6  
• PS#6 due |
| 8  | 11/29/05 | • DC machines  
• Commutators  
• Steady state performance  | • Fitzgerald, Chapter 7  
• PS#7 due |
<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Topics</th>
<th>Additional Information</th>
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<tbody>
<tr>
<td>9</td>
<td>12/6/05</td>
<td>- Permanent magnet machines</td>
<td>Fitzgerald, Chapter 8 and 9</td>
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<td></td>
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<td>- Variable reluctance machines</td>
<td>PS#8 due</td>
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<td>- Steppers</td>
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<td>- Single and two-phase motors</td>
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<td>10</td>
<td>12/13/05</td>
<td>- Issues in power electronics</td>
<td>Fitzgerald, Chapter 10</td>
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<td>- Power switches</td>
<td>PS#9 due</td>
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<td>- Rectification</td>
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<td>- Inversion</td>
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<td><strong>EXAM2</strong></td>
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<tr>
<td>11</td>
<td>12/20/05</td>
<td><strong>ALTERNATE DATE (if needed due to canceled class)</strong></td>
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<td>12</td>
<td>TBD</td>
<td><strong>ALTERNATE DATE (if needed)</strong></td>
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