Catalog data: EEC 673/773. Electronics and Electric Machines (4-0-4).
Prerequisite: EEC 574 or equivalent
Power electronics converters in the combination with electric machines. Field-oriented induction machine control, stability of an induction machine under the sine-wave supply, voltage source inverter drives, current source inverter drives, d, q modeling of induction and synchronous machines.


Reference:

Coordinator: Dr. A. V. Stankovic, Professor
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Goals: To deepen the understanding of power electronics converters in combination with electric machines.

Prerequisite by Topic: Power electronics converters, steady state operation of electric machines.

Course Outline:

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<th>Week</th>
<th>Topics</th>
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<td>2(Jan 19-23)</td>
<td>Basic Induction Machine Concepts</td>
<td>Chapman 7.6-7.11</td>
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<td>3(Jan. 26-30)</td>
<td>Measurement of Induction Machine Parameters Using an Inverter Supply</td>
<td>Class Notes</td>
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4(Feb.2-6)  **Lab 1** - Measurement of Induction Machine Parameters Using an Inverter Supply

5(Feb 9-13)  A Novel Method for Measuring Induction Machine Magnetizing Inductance  Class Notes
Review Session and Discussion

6(Feb 16-20)  **MIDTERM EXAM**

7 (Feb 23-27)  Voltage Source Inverter Drive (Six-step Inverter)  Class Notes

8 (Mar 2-6)  LAB 2- VSI Drive

9(Mar 8-15)  **Spring Recess**

10(Mar 16-20)  Voltage Source Inverter Drive  Class Notes
LAB 3 – Speed Control

11(Mar. 23-27)  (DC and Synchronous Motors)  Chapman
Review

12(Mar 30- Apr 3)  Introduction to variable Torque Drives  Class Notes

13(Apr 6-Apr 10)  Field-Oriented Induction Machine Control  Class Notes

14(Apr 13-17)  Field-Oriented Induction Machine Control  Class Notes

15(Apr 20-24)  Renewable Energy Sources  Class Notes
Review- Lecture on writing a paper and doing research

16(Apr 27- May1)  Student Presentations

**Projects:**
Laboratory experiments and simulation.

**Grading:**
Midterm - 45%
Final Exam - 40%
Lab Reports and Projects – 15%

**Homework:**
Has to be turned in on time.

**Computer Usage:**
PSpice
Software: MATLAB, Simulink, Saber

**Prepared by:**
Dr. A. V. Stankovic  **Date: 01 12 2015**