University of Wisconsin - Madison
College of Engineering [EGR]
Last Offered: 2014 Fall [1152]
Direct Link to this Syllabus :
http://aefis.engr.wisc.edu/index.cfm/page/CourseAdmin.ViewABET?coursecatalogid=315&pdf=True

1. **E C E 411, Introduction to Electric Drive Systems**
2. **Credits :** 3 **Contact Hours :** 3.0
3. **Textbook and Materials :** Introduction to Electric Machines and Drives, by D.W. Novotny, T.A. Lipo, and T.M. Jahns, UW-Madison, 2009.

a. **Other Supplemental Materials :** Electric Machinery, A. E. Fitzgerald, C. Kingsley and S. O. Umans, McGraw Hill Book Co., 6th Edition, 2002.

Power Electronics: Converters, Applications, & Design, N. Mohan, T.M. Undeland, and W.P. Robbins, J. Wiley & Sons, 2nd Edition, 1995.

- **Specific Course Information :**

a. **Brief description of the content of the course (Course Catalog Description) :** Basic concepts of electric drive systems. Emphasis on system analysis and application. Topics include: dc machine control, variable frequency operation of induction and synchronous machines, unbalanced operation, scaling laws, adjustable speed drives, adjustable torque drives, coupled circuit modelling of ac machines.
b. **Pre-requisites or Co-requisites :** ECE 355
c. **This is a Selected Elective course.**

- **Specific Goals for the Course :**

a. **Course Outcomes :**

1. Students should be able to carry out quantitative analyses to predict the steady-state operating characteristics of both induction and synchronous machines
2. Students should be able develop electric machine drive configuration to provide adjustable-speed control for a wide range of industrial and commercial applications
3. Students should be able to understand detailed specification sheets for electric machines and drives in order to evaluate its suitability for new applications

- **ABET Student Learning Outcomes :**

(a) Ability to apply mathematics, science and engineering principles.
(e) Ability to identify, formulate and solve engineering problems.
(j) Knowledge of contemporary issues.
(k) Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

- **Brief List of Topics to be Covered :**

1) DC Machine Drives

2) Variable Frequency Operation of Induction Machines

3) Variable Frequency Operation of Synchronous Machines

4) Inverter Operation and Modeling

5) Adjustable Speed Drives

6) Adjustable Torque Drives