Instructor:  Elias G. Strangas  
EB1218  
Tel.: 353 3517, email strangas@egr.msu.edu  
Office Hours: to be posted  
or by appointment, scheduled a day or two ahead, through e-mail.

Prerequisites
Undergraduate courses in Electrical machines - Energy Conversion and in Control Systems.

Meets:  M W, 5-6:20, 1225 Engineering Building.

Books


2. Ramu Krishnan, Electric motor drives : modeling, analysis, and control.

3. Ramu Krishnan, Permanent magnet synchronous and brushless DC motor drives.

4. Ramu Krishnan, Switched reluctance motor drives: modeling, simulation, analysis, design, and applications

5. Rik De Doncker, Duco W.J. Pulle and And Veltman, Advanced Electrical Drives Analysis, Modeling, Control  
http://www.springerlink.com.proxy2.cl.msu.edu/content/978-94-007-0179-3/#section=823839&page=1&locus=0


http://www.springerlink.com.proxy1.cl.msu.edu/content/p7n08q/#section=360367&page=1&locus=0
9. Werner Leonhard, Control of electrical drives.

What we’ll cover and how

At the end of the course I expect students to have learned and be able to do the following:

• Model AC machines at various frames of reference. The purpose here is to prepare for the analysis of operation and design of controls and fault diagnosis methods.

• Understand basic drive control schemes and implement them, at least in Matlab. These will include versions of field orientation, direct torque control etc.

• Develop observers and study their stability and errors, as well as the effect of errors on the operation of the drive.

• Understand, model, and account for nonlinearities in the machine and the delays, deadtimes, protection etc. in controllers and inverters.

• Determine experimentally the characteristics of electrical machines, so that they can be used in the implementation of controllers.

This class has students of various levels of knowledge and experience on the subject. I expect that all will improve their level of knowledge and skills. First we’ll spend a few weeks on fundamentals, to make sure that there is a common starting point.

There will be homework problems assigned regularly, as well as projects of interest to individuals. Those students who are already comfortable with some of the material listed above, will work on more independent projects, that may lead to a review paper or a publication.

There will also be a mid-term exam, the date of which we’ll discuss in class.