

## EE4807/5807 Electric Machine Drives I

University of Colorado at Denver and Health Sciences Center  
College of Engineering and Applied Science

Term: Fall 2009  
Course dates/days/times: T R 02:30-03:45p  
Course location: TBA  
Office Hours: TBA  
Website: <http://blackboard.cuonline.edu>

Professor: Jae-Do Park, Ph.D.  
Office location: NC2620  
Phone: (303) 556-2872  
email address: TBA

### Course Design

*Catalog Description:* Electric Machine Drive I covers power electronics drives for rotating electric machinery. Topics includes power electronics elements for drives, load characteristics, dynamic modeling of AC machines, control algorithms, system simulation, microcontrollers and practical commercial drives.

*Instructor Description:* This is the first course of two electric machine drive courses focusing on AC machine drives. EE 2142 and EE 3164 background is required. Knowledge on Matlab/Simulink will also be required. Senior standing or permission of instructor.

*Course Objectives:* By the end of the course, students are able to:

- Understand complex vector representation
- Model dynamic behavior of rotating machinery
- Understand different control algorithms for rotating machines
- Understand power electronics converters
- Understand microcontrollers for power converters
- Operate commercial induction machine drive

### Requirements

*Required Texts:*

- *Lecture Notes*
- *TBA*

*Recommended Texts:*

- Analysis of Electric Machinery and Drive Systems (2nd Edition)  
by Paul C. Krause, Oleg Wasynczuk, Scott D. Sudhoff  
Wiley-IEEE Press, ISBN-10: 047114326X
- Power Electronics: Converters, Applications, and Design  
by Ned Mohan, Tore M. Undeland, William P. Robbins  
Wiley, ISBN-10: 0471226939

*Assignments and Examinations:*

- Assignments – There will be several homework assignments during the course. Assignments will be due one week from the day assigned unless noted otherwise.
- Examinations – There will be two mid-term and one final exam. Exams will be in-class, closed book, closed notes. The mid-term exam dates are TBA. The final exam will be comprehensive and administered during finals week.

**Assessment Design**

*Grades:*

- Grades will be determined using either one of the following weights whichever gives higher grades.

	Weights A	Weights B
Assignments	25%	10%
Exam I	25%	15%
Exam II	25%	25%
Final	25%	50%
Total	100%	100%

- The final letter grade will be determined as follows. Scores will be rounded up to the nearest percentage.

A	B	C	D	F
100-90%	89-80%	79-70%	69-60%	59-0%

- Make sure all your work is neat and legible.

*Course Policies:*

- Class attendance is expected of all students.
- Homework assignments will be accepted in class only, unless noted otherwise. There will be 2-day grace period for homework assignments with 30% penalty.
- There is NO make-up exam except the documented cases, such as medical emergency with a written doctor’s excuse, notified no later than the day of the exam.
- Graded works will be returned in class directly to the student only.
- Cheating in any shape or form will not be tolerated and could result in a failing grade for the course. It will also be subject to disciplinary action per the College of Engineering and Applied Science Committee on Discipline.

**Course Communication**

Office hours

E-mail. Put “[EE4807/5807]” in the subject.

## **Course Schedule**

The following topics will be covered in the class. Detailed schedule is TBA.

1. Course background and introduction
2. Typical load characteristics and mechanics
3. Complex vector representation of electric machines
4. Modeling of electric machines
5. Variable speed drives
6. Control of electric machines

## **Students called for military duty**

If you are a student in the military with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact Paul Rakowski.