

ECE 802, Electric Motor Control

Tuesday and Thursday, 12:30pm to 1:45pm, 301 Riggs Hall

Instructor: Dr. Keith Corzine

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Office Hours: Tuesday and Thursday 9:30am-11:00am

Wednesday 1:30pm-4:00pm

Text: P.C. Krause, O. Wasynczuk, S.D. Sudhoff, and S.D. Pekarek, *Analysis of Electric Machinery and Drive Systems*, Third Edition, IEEE Press, 2013.

Grading:	Homework	25
	Simulation Assignments	15
	Projects	25
	<u>Exams (2)</u>	<u>35</u>
	Total	100

Course contents (subject to change):

Book chapter

Basic principles for electric machine analysis	1
Reference frame theory	3
Synchronous machine (SM) modeling and simulation	5
SM operational impedances, linearized models, and reduced-order models	7, 8,
SM control and micro grids	
SM power systems and Synchrophasors	
Permanent-magnet synchronous machines (PMSMs)	4
Brushless dc (BDC) drives	14
BDC field weakening	14
BDC rotor position sensing	
PMSM multiple reference frame theory	
Multiple reference frame estimator / regulator	
Induction machines	6
Induction motor (IM) drives with indirect vector control	13
IM direct torque control	
Dual-fed induction generators for wind power	
Switched reluctance machines	
Advanced switched reluctance machine models	
Multi-phase machines and drives	
Linear machines	
Homopolar dc machines	

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Notes:

- A number of software packages will be used for this course. Matlab/Simulink and/or PSCAD is required for some simulation assignments.
- Late assignments will receive a 25% reduction in grade.
- Neatness is expected on homework and exams and will be part of the grade.
- Consistent class attendance is expected. If it is not possible to attend class, please e-mail the instructor with the reason and arrange to obtain a copy of the course notes from a classmate.
- Discussing assignments with classmates is acceptable, but plagiarism will result in a grade of zero for the assignment. It is requested that students review the information on academic integrity at

<http://www.clemson.edu/academics/academic-integrity/>

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

- "It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation." Any student with an official Clemson University recognized learning disability must inform the instructor within the first week of class meetings so that arrangements can be made to meet the student's needs. Details on policies and procedures are available at www.clemson.edu/sds.
- This syllabus may be changed at any time during the course; with adequate notice to students given.