



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Advanced Topics in Electric Machines

ECE 7842

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Advanced topics of electric machines, beginning with dynamic modeling and principles of vector control and evolving into new design and control of electric machines for advanced traction motors and renewable energy generator systems.

Prerequisites and Co-requisites:

Prereq: 5041 and 5025, or permission of instructor.

Course Goals / Objectives:

- State-of-the-art electric machine and control methods will be introduced
 - Dynamic modeling and simulation skills will be enhanced
 - Practical design guidelines will be utilized in multiple week projects
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Course Topics:

- Winding functions and dynamic modeling of AC machines
 - D-Q transformation and reference frame theory
 - Vector control and field orientation principles
 - Variable speed operation and energy efficiency
 - Application example: electric traction motors for electrical and hybrid electrical vehicles
 - Application example: electric generators for wind turbine applications
 - Multiple-week project
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Designation:

Elective