



<b>Course</b>	ECE 32400 – Introduction to Energy Systems
<b>Type of Course</b>	Required for the EE program
<b>Catalog Description</b>	Fundamentals of electrical machines, power circuit analysis techniques, concepts including torque, speed, DC machine equivalent circuit, synchronous and asynchronous AC machines, rotating fields, application of electronics on electrical machines, smart grids and their applications in power engineering, use of composite materials in energy applications, and alternative energy methods including solar energy.
<b>Credits</b>	3
<b>Contact Hours</b>	3
<b>Prerequisite Courses</b>	ECE 25500, PHYS 251
<b>Corequisite Courses</b>	ECE 20800
<b>Prerequisites by Topics</b>	Understanding of the design and analysis of basic electronic circuits, frequency response of circuits, power concept, electromagnetism, magnetic properties of matter.
<b>Textbook</b>	<ul style="list-style-type: none"><li>▪ Principles of Electric Machines with Power Electronic Applications by Mohamed E. Hawary, Wiley- IEEE Press, 2<sup>nd</sup> Edition, 2002.</li><li>▪ Lecture Notes prepared by Dr. Eroglu</li></ul>
<b>Course Objectives</b>	To give students fundamental understanding of common electrical machines and concepts, power circuit analysis techniques, application of electronics on electrical machines, smart grids in power engineering, use of composite materials in energy applications, and alternative energy methods.
<b>Course Outcomes</b>	Students who successfully complete this course will have demonstrated: <ol style="list-style-type: none"><li>1. a basic knowledge of DC Machines [a,e]</li><li>2. a basic knowledge of AC machines [a,e]</li><li>3. an understanding of power circuit analysis techniques [a,e,k]</li><li>4. a basic knowledge of application of electronics on electrical machines [a,e,k]</li><li>5. a basic knowledge of smart grids [a,j]</li><li>6. a basic knowledge of alternative energy methods[a,j]</li></ol>

<b>Computer Usage</b>	Medium
<b>Laboratory Experience</b>	None
<b>Design Experience</b>	Medium
<b>Coordinator</b>	Abdullah Eroglu, Ph.D.
<b>Date</b>	15/2/11