ECE 32400 – Introduction to Energy Systems

Type of Course
Elective for the EE program

Catalog Description
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.

Credits
3

Contact Hours
3

Prerequisite Courses
ECE 25500, PHYS 25100

Corequisite Courses
ECE 20800

Prerequisites by Topics
Understanding of the design and analysis of basic electronic circuits, frequency response of circuits, power concept, electromagnetism, magnetic properties of matter.

Textbook
Principles of Electric Machines and Power Electronic by P. C. Sen, John Wiley & Sons, Incorporated 3rd Edition, 2014.

Lecture notes prepared by Dr. Momoh

Course Objectives
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.

Course Outcomes
Students who successfully complete this course will have demonstrated:

1. a basic knowledge of DC Machines (1)

2. a basic knowledge of AC machines (1)
3. an understanding of power circuit analysis techniques (1)
4. a basic knowledge of application of electronics on electrical machines (7)
5. a basic knowledge of smart grids (4)
6. a basic knowledge of alternative energy methods (4)

Computer Usage

Medium

Laboratory Experience

None

Design Experience

Medium

Coordinator

Date

09/28/2018