

CALIFORNIA STATE UNIVERSITY, CHICO
DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

Course Outline: EECE 481 Electromechanical Conversion

Instructor: Dr. Adel A. Ghandakly OCNL 308

Catalog Data: ELECTROMECHANICAL CONVERSION. 4 hours. Corequisite: EECE 211.
Principles of electromechanical conversion, traditional and renewable energy sources, magnetic circuits and steady state performance of synchronous, dc and induction motors, state space models and dynamic performance of electric motors, linearized models and common control schemes for various motors.

Prerequisites by topic: Electromagnetics, Amper's Law, AC & Three Phase circuit analysis.

Reference book: 1. Paul C. Krause, " Electromechanical Motion Devices", McGraw Hill,1989.

Textbook: 2. S. Nasar, " Electric Machines and Electromechanics", Schaum Outline.

Objective: Gain knowledge of: principles of electromechanical conversion, traditional and renewable electric energy sources, design features as well as the performance of electric motors, and studying the common control schemes for the various motors. The motors covered are dc, synchronous and induction motors.

Topics:

1. Assessment of the state of Energy in the US and the World.
2. Assessment of traditional electrical energy sources
3. Renewable Energy Sources:
 - a. Wind Energy Generation
 - b. Photo Voltaic Energy Generation
 - c. Overview of other renewable sources
4. Review of Magnetic circuits.
5. Principles of electromechanical energy conversion.
6. Steady state performance of synchronous motors.
7. Steady state performance of dc motors.
8. Steady state performance of three phase induction motors.
9. Steady state performance of single phase induction motors.
10. Introduction to control schemes of Electric Machines and state space modeling of machines.