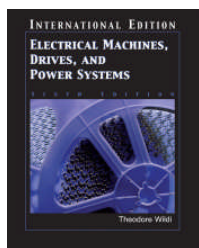


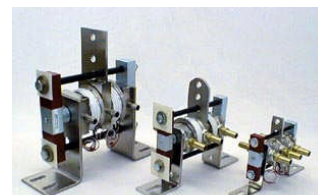
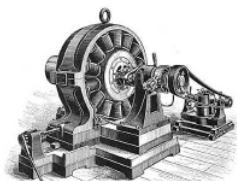
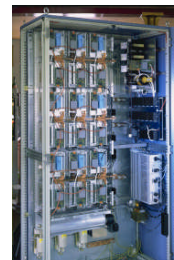
Electrical Machines and Drives

(EIN 4933/6935 – Fall 2011 – Mondays 6:00pm – 8:50pm)

Thomas Blair, P.E.



The American power industry is experiencing a talent drain of immense proportions. Over 50% of U.S. power engineers will be eligible to retire in the next 7 years, and the number of engineers entering the profession will make up only a small fraction of the experienced engineers leaving. In addition to this startling statistic, the U.S. infrastructure, including the power system, is deteriorated and antiquated. It is in desperate need of modernization. It takes qualified engineers to do this – and lots of them.



This is probably the best time ever to enter the power industry in the U.S. Of course there are no guarantees, but the outlook for a technically and financially rewarding career is fantastic.

Electrical Machines and Drives provides an excellent overview of the AC and DC electric power conversion machines and drives that control these machines. The purpose of the Electric Machines and Drives course is to introduce the basic theory and applications of motors, generators, and drives. Various electrical machines and their applications are introduced. The design and application of electric drives used in the starting and control of electric machines will be introduced as well. This course will review parts of an electric drive, electric machine, and application considerations. We will review the theory of operation of induction, synchronous, and DC machines. Equivalent circuits will be review to present simplified analysis methods. Motor & Generator parameters and their applicability to applications will be introduced.

Two field trips are planned to acquaint students with both rotating machines and the power control devices that control them. One field trip will be to view a motor rewind shop and will detail methods of motor rewinding process. The second field drip will be to view a power control manufacturing and engineering design facility.

Introduction

Fundamentals of Electricity,
Magnetism, Circuits, Mechanics &
Heat

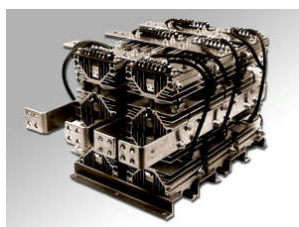
Electrical Machines

DC Motors
DC Generators
Efficiency & Heating of Machines
Active, Reactive, & Apparent Power
Three phase induction machines
Equivalent Circuits

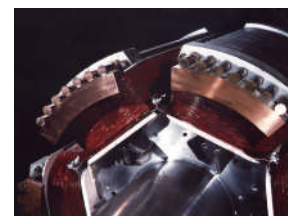
Synchronous Generators
Synchronous Motors
Single Phase Motors
Stepper Motors
3 Phase Induction Motors

Electrical and Electronic Drives

Basics of industrial Motor Control
Fundamental Elements of Power Electronics
Electronic Control of DC motors
Electronic Control of AC motors
Programmable Logic Controllers



Electrical Machines and Drives will be offered Fall 2011 on Mondays from 6:00pm-8:50pm. Like all power electives, Electrical Machines and Drives is available online. For more information, please contact; Dr. Fehr at fehr@eng.usf.edu.



Class Website: thomasblairpe.com/EMD