

ELECTRICAL POWER and ENERGY SYSTEMS

MUCH MORE THAN JUST $\sqrt{3}$!

Have you ever wondered, when flipping on the lights, what's involved in getting that electricity to your home? Until a power outage occurs, you probably take it for granted.

The North American Power Grid is the largest and most complex single system in the world. All generation, transmission, distribution, and consumers are interconnected -- the grid is controlled and operated as a whole. Deregulatory trends, energy marketing, economic pressures, and the resulting complex problems demand prompt high-tech solutions. Demand for energy remains high and is growing.

MANY KINDS OF POWER SYSTEMS

There are many other types of Power Systems besides the Utility Power Grid that most of us think of. Each presents its own unique and exciting engineering challenges.

- Spacecraft
- Shipboard
- Large Industrial Facilities
- Off-Grid Alternative Energy Systems
- Aircraft
- Automobile

WHERE THE JOBS ARE

Power Systems Engineers perform design, do research and computer studies, provide system operation and maintenance guidance, engage in marketing, etc. Typical employers are:

- Consultants and Research Firms
- Software Developers
- Utilities (i.e. Power Companies)
- Electrical Equipment Manufacturers
- Factories and other large power users
- Hospitals and other special facilities
- Military & Government Regulatory Agencies
- Environmental Agencies and "Concerns"

Most career opportunities are presently with utilities, engineering design consultants, and large industrial power users. The job market for Power Engineering graduates tends to be less sensitive to the periodic economic slow-downs that impact other engineering areas.

Join IEEE Student Power Engineering Society !

www.ee.mtu.edu/stu_orgs/ieeepes/

ELECTRICAL POWER SYSTEMS AT MTU

Electrical Power is the broadest area within the Department of Electrical Engineering. Students are prepared for a rewarding career of increasingly high-tech and state-of-the-art challenges. Power Area students typically take the courses listed below (electives in Power Electronics and other topics may also be available):

- EE3120 - Intro to Energy Conv & Power Systems
- EE3221 - Introduction to Motor Drives
- EE4221 - Power Systems Analysis I
- EE4222 - Power Systems Analysis II
- EE4223 - Power System Protection (odd yrs)
- EE4225 - Power Distribution (even yrs)
- A full-year senior design project

Power Systems Engineers benefit from having a broad knowledge of electrical engineering and other engineering disciplines listed below. Power Area students can therefore make use of what they learn from all EE core courses. Some students also take a "double option," adding an additional focus in electronics, controls, etc.

- Analysis of Circuits and Large Networks
- Communications and Signal Processing
- Computer Applications and Interfacing
- Control Systems and Digital Logic
- Electromagnetics
- Electronics and Materials

FACILITIES AND LEARNING ENVIRONMENT

Power Area students have access to state of the art computing and energy conversion laboratories. Class sizes vary from 10 to 35 students, allowing for a relaxed classroom setting and individual attention from the faculty members. Students often have the opportunity to accompany faculty to engineering conferences, where they can meet engineering professionals and potential employers. Field trips and industry speakers are also arranged by the IEEE Student Power Engineering Society.

FACULTY

The three Power Systems faculty possess a combined wealth of experience, having worked in industry as engineers. They are all licensed professional engineers, have performed research, and worked and traveled abroad. We have the perspective and experience to prepare you for your career -- we've been there. Feel welcome to stop by and talk about Power and Energy, career opportunities, and the possibility of a Masters degree after your BSEE.

- Dr. Leonard Bohmann, P.E. EERC 236
- Dr. Bruce Mork, P.E. EERC 623
- Dr. Dennis Wiitanen, P.E. EERC 234