NEW TECHNICAL ELECTIVE COURSE IN
ELECTRICAL ENGINEERING

EE445/645 Power System Operation with Renewable Energy Sources

Spring 2010

Electrical & Biomedical Engineering Department
University of Nevada Reno

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Tuesday/Thursday 11:00a - 12:15a

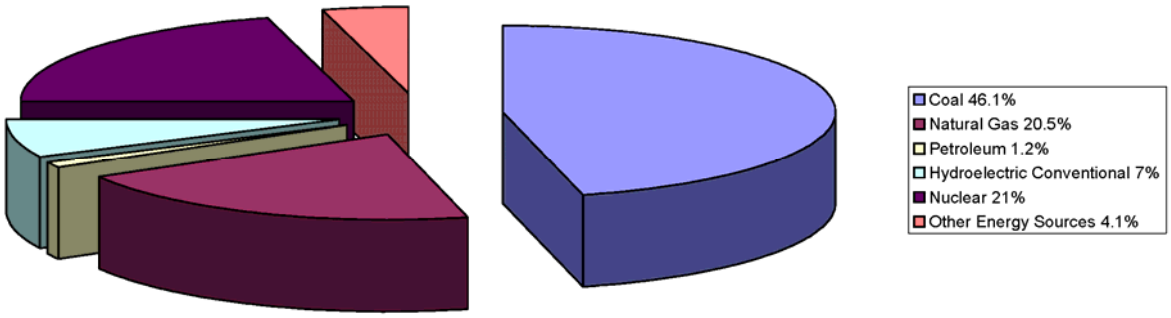
http://ee445.ee.unr.edu

(3+0) 3 credits

Renewable energy, distributed generation, impacts of renewable energy based generation on power system operation, electrical energy markets, deregulated power system, hybrid power generation.
(*Pre-requisite*: EE440 Power System Analysis)

This course will describe how large-scale interconnected power systems and energy markets are structured and governed in the U.S. The fundamentals of power system operation will be introduced. Deregulated power system environment will be compared to the previous custom of regulated environments. The advantages and disadvantages of the current deregulated power system industry will be discussed. The students will be introduced to various energy types for electrical power production and their use in the power system operation.

The advantages and disadvantages of different energy sources will be summarized and wind, solar, geothermal based power generation will be emphasized. The impacts of these unconventional plants on power system operation and energy markets will be introduced by analyzing the benefits as well as the challenges in power system operation concurrently. Students will be exposed to using MATLAB Power System toolbox as wells as programming, state-of-art software packages in electrical power industry such as PSS/E, PowerWorld, ATP/EMTP to analyze the different modes of power system operation while the renewable energy based power generation is present.



Net Generation Shares by Energy Source in the US: Year-to-Date through April 2009 (Courtesy of DOE EIA)