EC417 -- Electric Energy, Adapting to Renewable Resources  
Fall 2014

Topics:

• Brief History of Power Systems (the great AC-DC battle)
• AC circuit analysis
• Basic Components of Power Systems (generation, transmission, distribution -- electric motors and other loads)
• Power Plants with emphasis on renewables (solar, wind, fuel cells, biomass)
• Analysis methods for 3-phase systems
• Real and Reactive Power and Power Factor calculations
• Transformers
• Introduction to Power Electronics and AC/DC and DC/AC converters with application to high voltage circuits
• The Power Grid and the topology of Power systems
• Power system simulation methodologies (POWER WORLD)
• Methods for monitoring, control, and optimization of Power Systems including issues related to stability and "blackouts" (especially those related to the introduction of renewables (Photovoltaics, wind, etc.)
• Development of the "Smart Grid"
• Electric Vehicles
• A whole new set of problems with the future introduction of PHEVs (Plug-In Hybrid Electric Vehicles) and EVs along with issues related to their "charging stations"
• Future directions and the resulting impact on the current electric utility industry which will be greatly impacted by new developments in storage technology, electric transportation, and LED lighting.

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Grading Policy:

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Instructor:

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Announcements / Assignments: Blackboard Learn