Power Systems Engineering

The objective of the certificate in Power Systems Engineering is to provide students with the knowledge to be involved with the technology advancements and future developments in power generation, controls, and management as well as with alternate and new energy resources. This program will prepare engineers to work in the power and energy industry. Academic programs in energy technology and management are needed to prepare the future workforce for the energy and power industry as more than fifty percent of the workforce in the power industry is retiring during this decade. At the same time, developing new, clean, and more efficient energy resources and technologies is of global significance.

Who is suited for this program?

Power Systems Engineering is ideal for preparing future engineers in the power and energy industry. Additionally, it fits students who are interested in technology advancements and future developments in the power generation, control, and management as well as alternate and new resources.

What will I learn?

- Power system steady-state analysis of power system networks, particularly real and reactive power flows under normal conditions and current flows under faulty conditions. Symmetrical components and digital solutions are emphasized.
- Computer methods applied to power systems and digital computer techniques proven successful in the solution of power system problems, particularly in the electric utility industry. Emphasis on short-circuit, load flow, and transient stability problems. Matrix sparsity is considered.
- Transient performance of power systems with lumped properties, interruption of arcs, restriking voltage, re-ignition inertia effects, switching of rotational systems, magnetic saturation in stationary networks, harmonic oscillations, saturated systems, transient performance of synchronous machines.
- Protection of power systems
- Theoretical developments and computer methods in determining economic operation within the boundaries of a given steam-electric operating area. Energy accounting control and economic theories for interconnected steam and hydroelectric power systems.

Why study Power Systems Engineering at NJIT?

Energy resources and technology has become a key thrust area of significant importance at several leading institutions. With the synergy in nanotechnology, solar cells and other related sciences at NJIT, an advanced energy technology initiative was formulated to offer an academic and research program in energy resources, technology management, and alternate energy research.

Academic programs in energy technology and management are much needed to prepare the future workforce for the energy and power industry as more than 50% of the workforce in the power industry is retiring in this decade. At the same time, developing new, clean and more efficient energy resources and technologies is of global significance.

Prerequisites

Applicants are expected to have undergraduate backgrounds in physics, mathematics (through differential equations and vector analysis), electrical networks and devices, electronics, analysis and design methods, transients, electromagnetic fields, and appropriate laboratory work in some of these areas. Completion of a Bachelor’s degree with a overall cumulative Grade Point Average of 2.8 or higher on a 4.0 scale.

Related Degree Programs

All credits for the Power Systems Engineering Certificate relates in its entirety to either MS in Electrical Engineering (http://catalog.njit.edu/graduate/newark-college-engineering/electrical-computer/electrical-ms/) or MS in Power and Energy Systems (http://catalog.njit.edu/graduate/newark-college-engineering/electrical-computer/power-energy-systems-ms/).

Gainful Employment Disclosure

Click here (http://www.njit.edu/graduatestudies/sites/graduatestudies/files/gainfulemployment/power-systems-engineering-cert-gainful-employment.html) for the Gainful Employment Disclosure for this program

What are the Required Courses?

Code	Title	Credits
Core Courses		
ECE 610	Power System Steady-State Analysis	3
ECE 618	Renewable Energy Systems	3
Electives		
Select two of the following:		6
ECE 611	Transients in Power Systems	

ECE 613	Protection of Power Systems
ECE 618	Renewable Energy Systems
ECE 698	Selected Topics in Electrical and Computer Engineering