SIEMENS

Siemens Power Technologies International (Siemens PTI)

Siemens PTI Academy

Schenectady, NY, USA

Power System Training Program (Eight Weeks Long)

1 PSEC_515: Project Management for Power System Engineers (2 days)

Project teams face challenges such as aggressive deadlines, scope creep, communication breakdowns and financial constraints. It takes solid project management skills and knowledge to successfully manage these challenges and achieve project success.
This course discusses and examines tools used in the project management process for scheduling and controlling the types of projects a power system engineer would encounter.

2 PSEC_580: Industrial Power System Applications (3 days)

The efficient design and continuous modernization of plants is a crucial factor in order to secure sustainable business success in all industries. The objective of the Industrial Power Systems Applications course is to provide participants with a basic understanding of power system analysis that will enable them to make the best decisions across the lifecycle of their plant and equipment – from initial project planning through operation and maintenance or for expansion of the existing plant.
This course is intended for electricity distribution and industry engineers who are responsible for the supply of electrical energy to process and manufacturing facilities.

3 PSEC_535: Power System Studies for Integration of Transmission Scale Renewable Generation and Energy Storage (4 days)

Understanding the role of renewable energy in the power supply portfolio is critical when developing a reliable and feasible power system that also meets Renewable Portfolio Standards and reduces the utility's carbon footprint. But, with the increase of renewable generations come the challenges of intermittency and in-flexibility. Power system engineers need an appreciation of the planning and operational impacts of integrating renewable generation into the transmission system and an understanding of renewable energy policies that are created to sustain and grow this largely unharnessed energy source.
Energy storage is a growing technology that is often seen as a potential solution to some of the renewable integration challenges.
The primary objective of this course is to provide an overview of the technical challenges and benefits of integrating large amounts of renewable generation (wind and solar) and energy storage into the transmission system, along with the power system studies that need to be conducted.
The course requires no specialized background in power system engineering but does presume a general understanding of the power and transmission systems.

4 PSEC_600: Power System Dynamics – Introduction (4.5 days)

Understand the dynamic models of power system components and the classical control techniques to determine power system transient and small signal stability. The Power System Dynamics – Introduction course explores both theory and practice for modeling major power system components, such as synchronous machines, excitation systems, governors and loads, and provides examples using PSS®E.

Topics covered in PSEC 600 include:

• Modeling synchronous machines for stability studies

• Understanding the synchronous machine model development procedure

• Modeling DC, AC and static excitation systems

• Examining the characteristics of prime movers and developing models that can be used in power system studies

• Exploring the characteristics of load models such as constant power (MVA) load, polynomial load, exponential load, etc.

• Modeling of induction motors

• Studying the transient behavior of synchronous machines due to electrical and mechanical phenomena

• Exploring the factors affecting small signal stability

• Understanding the design, structure and use of power system stabilizers (PSS)

Upon completion of this course, participants will have a better understanding of dynamic effects encountered in the operation of the power system and its expansion planning analysis.

5 PSEC_635: Power System Scheduling and Market Operations (3 days)

This course provides the link between the physical system components and the market. It covers a variety of topics including market operations, economic dispatch, unit commitment, automation generation control, operating security and interchange evaluation, and power systems state estimation. Instruction will cover different power generation sources, the various measures of power plant efficiencies and how to plot these measures from plant test or design criteria. This course includes hands-on examples using PSS®E.

Upon completion of this course, participants will have a basic understanding of the energy management and control center activities of economic dispatch, unit commitment, electricity market operations, automation generation control, contingency analysis and state estimation. This is a great course for technicians, operators, economists, engineers and most professionals in the industry.

6 PSEC_720: Economic Transmission Planning (2 days)

Today's transmission system is challenged with renewable energy integration, competing interests of investors, consumers and environmental advocates, and the increasing role information technology plays in the delivery of electric energy. The growth in behind-the-meter solutions from demand response to on-site generation, and the emergence of alternative networks, such as micro-grids, means that the transmission system's reliability function has become more complex, and the economic evaluation of competing projects, less straightforward. The range of potential market outcomes is greater than ever before, and the evolving design of America's power delivery system is more uncertain.

The primary objective of this course is to teach fundamental and advanced economic concepts as an integral component of transmission planning and project evaluation. Other objective is to instill in transmission planners the economic and transmission concepts that will allow for best in class project planning and analysis.

7 PSEC_640: Protective Relaying – Fundamentals (3 days)

Protective devices serve to increase system performance and play a crucial role in minimizing equipment damage and customer outages that can result from short circuits and other abnormal power system operating conditions. Protective relays and other protective devices are vital in maintaining reliability in today's electric power systems.
Protective Relaying – Fundamentals is designed for engineers interested in deepening their practical understanding of the protective devices and systems commonly used in generation, transmission, sub-transmission and distribution systems.
Upon completion of this course, engineers working in all areas of power system planning, operations, testing and construction will be able to better relate the operation of the protective system to their particular area of responsibility.

8 PSEC_750: Advanced Distribution Analysis and Planning Study Techniques (2 days)

Only a few years ago performing simple peak load and minimum load steady state studies, along with simple protection studies were sufficient to plan the distribution system. However, with new technologies integrating into the distribution system such as distributed generation, energy storage, distribution automation etc., increasingly complex studies are required.
In this course students will learn from our expert instructors who perform these complex studies on a daily basis. Upon completion of this course, participants will be armed with the knowledge to perform these studies and better positioned to cope with an ever increasingly complex distribution system.

9 PSEC_740: Advanced Transmission Analysis and Planning Study Techniques (4 days)

Just as transient stability studies shook up the transmission planning industry back in the 1920s and 30s, new requirements to ensure safe and reliable system operation are now increasing the number and variety of studies being performed.

In this course participants will gain practical knowledge in performing advanced studies such as: black start, NERC compliance (CIP-014 and PRC-006), subsynchronous resonance, and voltage stability.
Through completion of this course, participants will gain a thorough understanding of requirements for these advanced studies, as well as basic knowledge in performing these studies utilizing PSS®E.

10 PSSC_655: Power Electronics in Transmission Systems (4.5 days)

Utilities are incorporating a multitude of new technologies in order to optimize their ability to supply and deliver power efficiently and economically. Among these technologies, HVDC (high voltage direct current) and FACTS (flexible AC transmission system), are the most prominent. The Power Electronics in Transmission Systems (PETS) course presents operating and control fundamentals of these technologies. This hands-on course includes PSS®E based simulation examples of these technologies.
Upon completion of this course, participants will have a comprehensive understanding of the principles involved in power electronics devices and will be able to apply this knowledge when incorporating these devices into their transmission system.

11 PDEC_620: Distributed Generation & Energy Storage Applications (2 days)

Distributed generation (DG) is becoming a key component of current and future energy strategy in the US and throughout the world. The Distributed Generation and Energy Storage Applications course focuses on DG technologies, the power system impacts of DG, DG interconnection requirements and issues/solutions that must be addressed to integrate DG onto the electric power system.

12 PDEC_655: Distribution Automation for Smart Grids (3 days)

This course addresses the existing technologies for the automation of distribution substations and networks. Distribution automation equipment and software, as well as distribution automation technical and economical aspects will be discussed, and Siemens experience in real life applications will be presented.