



Siemens Power Academy Certification Programs

Answers for energy.

SIEMENS

At a glance

Whether it is training for power system engineers, commissioning engineers, control room operators, or field maintenance and repair personnel, Siemens Power Academy TD – North America (NA) and the consultants at Siemens Energy Inc., Siemens Power Technologies International (Siemens PTI) want to be your comprehensive partner in T&D training and professional development. We offer:

- Professional certifications
- Training for career progression
- Short courses designed to teach technical skills quickly
- Courses at our training centers or customized on-site delivery
- Expert instructors and practical content that counts.

The Siemens Power Academy TD – NA believes that training is a component critical to the success of any organization. With our long history in the fields of power generation, transmission and distribution, instrumentation and controls, equipment-based training and emerging technology, Siemens PTI offers training solutions along the entire power conversion chain.

The challenge

As power engineering programs disappear from the academic landscape and experienced mentors retire from the industry, there are fewer and fewer resources from whom power engineers can learn. Moreover, as the requirements for power systems become ever more complex, engineers with rigorous training and certification will be in exceptional demand at the world's leading utilities and system operators.

Our solution

The Siemens Power Academy has long been recognized as the authoritative source for advanced training certification. Developed and taught by global leaders in power system engineering, our courses equip you with the skills and knowledge to address today's issues, as well as tomorrow's challenges. These skills, in turn, will position you not only to advance your career, but to rank among the most accomplished engineers in the field. Our programs are designed for engineers at every stage of their careers. So

whether you are an entry level engineer or have more advanced experience, we have a program that is right for you.

How do certification programs work?

Siemens Certification can be earned at the Associate, Advanced and Expert levels. For each certification level, you complete a series of required and elective courses and validate your learning by passing online exams (E-tests). Upon completion of all the requirements, you receive your certification from Siemens Power Academy TD – NA. Logically sequenced, interrelated and taught in a real-world context, each certificate level builds on the one before in a hierarchy of skills and knowledge.

Benefits of certification

Earning Siemens Power Academy TD – NA professional certification enhances your path to productivity, sets you apart from your peers, adds depth to your understanding of the field and ability to meet the demand for skills in the global market place. With fewer available on-the-job resources, engineers who invest in rigorous training and gain certification will be in exceptionally high demand at the world's leading utilities and system operators.

Earn Siemens Power Academy TD – NA Certification in the following programs: Power Systems Technology, Distribution Systems Technology, or PSS® Network Planning and Analysis. Professionals can pursue certification at the Associate, Advanced, or Expert Levels. Contact your Siemens Power Academy Training TD – NA to get started today.

Program management

Siemens Power Academy TD – NA will assign staff to work directly with you to facilitate your progress through your chosen certification program. Siemens Power Academy TD – NA will provide you with reports and records related to the attendance, course completion, progress, and exam results at the conclusion of each course.

Program management services are designed to enhance your learning experience, drive learning outcomes, and ensure quality and consistency throughout the program. Program management services include but are not limited to: communicating course schedules, delivery of content, coordination of instructors, program material

management, tracking and reporting of participant attendance, assignments, and exams, records management, access to content and participant use of the Siemens Learning Management System (LMS).

Program schedule and logistics

The certification programs require the successful completion of four or more courses. We understand that it may be difficult to find the time to attend consecutive week-long sessions, and some people may want to obtain their certifications as quickly as possible. With this in mind, Siemens Power Academy TD – NA makes it a point to offer the classes you need several times annually in a variety of locations. We also schedule classes that are required for certification in seasonal groups to allow students the opportunity to achieve their certifications in a matter of weeks.

Course structure

Courses range from three (3) four and one-half (4.5) days. Material is presented in both morning and afternoon sessions for a total of six (6) hours of daily instruction. Standard course hours are 9:00 am to 4:00 pm each day. Friday sessions typically conclude at noon.

Instructors

All courses provided through Siemens Power Academy TD - NA are taught by Siemens PTI consultants and field experts who are practicing engineers with current experience in the material they present. Our instructors are well known for their contributions in their respective engineering disciplines and have stature in related IEEE committees. In addition to their technical expertise, our instructors possess the desire to transfer technical knowledge and concepts to others and the proven ability to do so.

Documentation

For every course in the program, bound sets of course notes, which include printed copies of the instructor's presentation and relevant handouts, will be provided to each course participant. An index will be included at the end of the course notes to help the participants refer to key theories, equations, and equipment within the material.

Associate Level Certification

Associate Level certification provides foundational coursework for engineers who are in their first few years of employment or transferring from mechanical or civil engineering. Upon completion of the required coursework and assessments, students perform work under direction while translating, interpreting and extrapolating key concepts, methodologies, principles, theories and industry practices. This level of certification positions candidates for advancement and prepares them for more challenging work assignments as they develop in their positions.

Advanced Level Certifications

Advanced Level certification can be achieved in three different concentrations: Distribution Systems Technology, Power Systems Technology, PSS® Network Planning and Analysis. Participants typically have three years' work-related experience in their elected area of study. Upon completion of the required coursework and assessments, they should be able to solve practical problems, work independently and apply engineering principles effectively as they become productive contributors to their organization.

Advanced Certificate in Distribution Systems Technology

Upon completion of four designated courses and associated E-tests, you will earn your certificate and be able to demonstrate competencies in:

- Identifying power distribution systems, including transformers, regulation and secondary fault currents, voltage unbalance and unsymmetrical loading, transformer bank loading equations (4-W Delta/4-W Wye), switching overvoltages, fundamentals of fuse application to pole-top units, currents and overvoltages during faults, relays, circuit breakers, reclosers, sectionalizers, switches and fuses and distribution system grounding (PDEC 540)
- Evaluating the basics of utility finance and engineering economics applied to loss evaluations, including the fundamental principles and economic considerations, electric utility development and regulation,

distribution system losses (introduction), load and loss factors, transformer and estimate losses, parameters for economic evaluations, development of purchasing formulas, computerized techniques, relationship between real and reactive power and fundamentals of complex power (PDEC 563)

- Identifying design parameters and considerations, bus arrangements, drawings, specifications, electrical clearances, structures, foundations, grounding design, conduit design, protection/monitoring/maintenance of major station components, system requirements, switching arrangements, insulation coordination, grounding, noise and lightning, protective relaying, application to lines, transformers, buses, reactors, capacitors, etc., major equipment specifications and testing/monitoring/maintenance (PDEC 591)
- Fundamentals of system design and operation: practices used for feeder grid spot network systems (dedicated and non-dedicated), overview of grid network systems, system design (substation and primary feeders), primary system grounding schemes, cable limiter types, functions, time-current, power flows during normal conditions and faults, identification of parameters significantly affecting network voltages, protective relaying and coordination for primary feeder faults, minimum loading required for forward power flows, the Siemens PTI low-voltage spot network simulator, input data requirements and data editing, closed transition switching/ generation on spot networks and network relay testing (PDEC 630).

Advanced Certificate in Power Systems Technology

Upon completion of four designated courses and associated E-tests, you will earn your certificate and be able to demonstrate competencies in:

- Understanding double voltage contingency risks, avoiding outage-related voltage collapse, undervoltage load shedding as a cost-effective solution, voltage and reactive planning, equipment voltage characteristics, analytical tools, analytical methods, voltage characteristics, bulk

system voltage characteristics and reactive power planning (PSEC 510)

- Understanding the technical considerations for integrating large amounts of wind turbine generation into the power system; interconnection requirements including low-voltage ride through (LVRT), ramp rate limitations, and supply of ancillary services for frequency and voltage control: current practices and industry trends; wind turbine generator types and technical capabilities for participating in the active power and ancillary services markets; trends in generator sizes, technology and location (offshore versus onshore); modeling of wind turbine generators for steady-state and stability analyses, steady-state and voltage stability impacts of integrating large amounts of wind turbine generation; wind integration operational impacts; frequency regulation (AGC and spinning reserve), load following (economic dispatch) and unit commitment; market impacts of wind integration: forecasting, day-ahead and hour-ahead markets (PSEC 535)
- Understanding the basics of power system dynamics, with emphasis in many practical aspects, as well as addressing the basic theoretical background; methodology of engineering analysis presented using the latest power system simulation tools; modeling of synchronous generators, excitation systems and speed governor system stability (PSEC 600)
- Methods and techniques used to schedule and operate electric power supply systems in an economic and secure manner; operation and control functions, characteristics of generating units, economic dispatch, introduction to the problem and solution techniques, transmission losses, base points and participation factors, daily load forecasting, constraints, reserve requirements, generation control, models, AGC, implementation, economy interchange, types of pool operation, energy broker systems, operating security, factors/functions, operator load flows, contingency analysis, corrective dispatch, state estimation, theory, methodology, applications (PSEC 635).

Advanced Certificate in PSS® Network Planning and Analysis

Upon completion of four designated courses and associated E-tests, you will earn your certificate and be able to demonstrate competencies in:

- Use and understanding of PSS®E software's Power Flow and Fault Analysis features; build confidence with most program functions in sufficient detail to begin work relevant to power flow, fault analysis and other types of steady-state analysis; obtain practical experience in basic power flow modeling data, creating one-line diagrams, power flow solution and reports, data addition and modification and checking, program automation, response files – IPLAN and Python, contingency and transfer limit analyses, balanced switching, fault analysis, line properties calculator, data management, special applications – PV and QV analyses, inertial/governor power flows (PSSC 500)
- PSS®E power flow and dynamic simulation data, PSS®E dynamic simulation approach, steady-state model setup, initialization, data documentation, running dynamic simulations, examining results, data checking, simulation options, run automation, auxiliary programs, adding models, relay modeling, model library overview, user-written models (introduction), extended term simulation and data management (PSSC 550)
- Sensitivity of the first contingency incremental transfer capability (FCITC) to uncertainties and formation of quantitative basis for OASIS postings. You will understand the process transactions as they relate to network reliability in the competitive environment; apply the PSS®MUST software program to efficiently calculate electric transmission transfer capabilities in grids the size of the Eastern Interconnection; understand the impact of transactions and generation dispatch variations on flows and transfer capabilities; analyze results for confidence in posted transmission limits; understand FCITC calculations, transfer limits, DC transfer analysis, AC-based transfer analysis; demonstrate PSS®MUST input data setup, tracing input errors, subsystem files, monitored files, contingency files, exclude files; perform contingency analysis (AC and DC), pre-shift case analysis, parametric contingency analysis, AC contingency analysis; determine corrective actions; understand flowgate implementation in PSS®MUST, transaction impact analysis, bubble diagrams and

interface analysis; monitor elements impact, understand sensitivity analysis, parallel transfer analysis, generation sensitivity analysis and transaction scheduling (PSSC 700)

- Applying PSS®E load flow and short circuit interface; transformer modeling; two and three-winding transformers, load flow and short circuit representation; fault analysis applications, automated fault calculations, ANSI and IEC calculation procedures, evaluation circuit breaker duty; modeling of FACTS devices, SVC, STATCOM, UPFC, conventional HVDC, voltage source converter DC; voltage analysis, non-divergent load flow, voltage collapse, PV and QV analyses; introduction to optimal power flow, controls and constraints, sample applications; contingency analysis, DC and AC contingency analyses, single and multiple cases reporting, contingency ranking, network islanding and redispatch, corrective action; program automation, response files, application program interface and introduction to Python (PSSC 710)

Expert Level Certification

Expert Level certification is typically sought by more experienced professionals. Upon

completion of the required coursework and assessments, participants should be able to perform complex technical tasks independently; advise others on the performance of these tasks; evaluate, synthesize and communicate abstract concepts; and make judgments about information and validity of ideas. See course requirements at each level of certification and Advanced Level certification options.

Expert Certificate in Power Systems Technology

Four elective courses and E-tests at the 600+ level; suggested courses include:

PDEC 655 – Distribution Automation and Analysis for the Smart Grid
PSEC 638 – Power System Reliability
PSEC 640 – Fundamentals of Protective Relaying
PTEC 620 – Advanced Transmission Planning with Modern Network Analysis Tools

PSSC 600 – Using Python to Integrate PSS®E Workflow
PSSC 715 – PSS®E – Advanced Dynamic Simulation
PSSC 720 – PSS®E – Modeling Writing
PSSC 790 – Reactive Power Planning Using PSS®E

Advanced Certificates (concentration options)

Four required courses and E-tests in each concentration

DISTRIBUTION SYSTEMS TECHNOLOGY

PDEC 540 – Distribution Transformers, Grounding and Protection (NERC*)

PDEC 563 – Understanding System Losses (NERC)

PDEC 591 – Introduction to Substation Engineering and Operations

PDEC 630 – Low Voltage Secondary Networks (NERC*)

POWER SYSTEMS TECHNOLOGY

PSEC 510 – Analytical Methods for Voltage Control and Reactive Power Planning (NERC*)

PSEC 535 – Power Systems Studies for Wind Integration (NERC)

PSEC 600 – Introduction to Power System Dynamics (NERC)

PSEC 635 – Power System Scheduling and Operation (NERC)

PSS® NETWORK PLANNING AND ANALYSIS

PSSC 500 – PSS®E – Introduction to Power Flow and Steady State Analysis (NERC*)

PSSC 550 – PSS®E – Introduction to Dynamic Simulation

PSSC 700 – PSS®MUST – Managing and Utilizing System Transmission

PSSC 710 – PSS®E – Advanced Power Flow

Associate Certificate in Power Systems Technology

Four courses and E-tests (3 required and 1 elective)

PDEC 500 – Introduction to Distribution Systems and Power Circuit Analysis (NERC)
PSEC 505 – Power Flow Analysis with Applications (NERC)
PTEC 500 – Fundamentals of Overhead Line Design
PSEC 515 – Introduction to Project Management for Power System Engineers (recommended elective)

Spring 2011 Sessions

Associate Certificate in Power Systems Technology – 9.9 CEUs

Dates	Course ID	Course Name	Price
3/7/11-3/11/11 (4.5 Days)	PDEC500	Introduction to Distribution Systems and Power Circuit Analysis – NERC	\$2,695
3/14/11-3/18/11 (4.5 Days)	PSEC505	Power Flow Analysis with Applications – NERC	\$2,695
3/21/11-3/25/11 (4.5 Days)	PTEC500	Fundamentals of Overhead Transmission Line Design	\$2,365
3/29/11-3/31/11 (3 Days)	PSEC515	Introduction to Project Management for Power System Engineers	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due April 1, 2011)			\$8,882.50

Associate Certificate in Power Systems Technology – 9.9 CEUs

Dates	Course ID	Course Name	Price
5/4/11-5/6/11 (3 Days)	PSEC515	Introduction to Project Management for Power System Engineers	\$2,365
5/9/11-5/13/11 (4.5 Days)	PDEC500	Introduction to Distribution Systems and Power Circuit Analysis – NERC	\$2,695
5/16/11-5/20/11 (4.5 Days)	PSEC505	Power Flow Analysis with Applications – NERC	\$2,695
5/23/11-5/27/11 (4.5 Days)	PTEC500	Fundamentals of Overhead Transmission Line Design	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due April 1, 2011)			\$8,882.50

Summer 2011 Sessions

Advanced Certificate in Network Planning and Analysis Using PSS®E – 9.9 CEUs

Dates	Course ID	Course Name	Price
6/6/11-6/10/11 (4.5 Days)	PSSC500	PSS®E - Introduction to Power Flow and Steady State Analysis – NERC*	\$2,365
6/13/11-6/15/11 (4.5 Days)	PSSC550	PSS®E - Introduction to Dynamic Simulation	\$2,695
6/27/11-7/1/11 (4.5 Days)	PSEC510	Analytical Methods for Voltage Control and Reactive Power Planning – NERC	\$2,695
7/25/11-7/29/11 (4.5 Days)	PSSC710	PSS®E – Advanced Power Flow	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due May 1, 2011)			\$8,882.50

Advanced Certificate in Power Systems Technology – 9.9 CEUs

Dates	Course ID	Course Name	Price
6/6/11-6/10/11 (4.5 Days)	PSEC600	PSS®E - Introduction to Power System Dynamics – NERC	\$2,365
6/14/11-6/16/11 (3 Days)	PSEC635	Power System Scheduling and Operations	\$2,695
6/20/11-6/24/11 (4.5 Days)	PSEC535	Power System Studies for Wind Integration – NERC	\$2,695
6/27/11-7/1/11 (4.5 Days)	PSEC510	Analytical Methods for Voltage Control and Reactive Power Planning – NERC	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due May 1, 2011)			\$8,882.50

Advanced Certificate in Network Planning and Analysis Using PSS®E – 9.9 CEUs

Dates	Course ID	Course Name	Price
6/27/11-7/1/11 (4.5 Days)	PSEC510	Analytical Methods for Voltage Control and Reactive Power Planning – NERC	\$2,365
7/11/11-7/15/11 (4.5 Days)	PSSC500	PSS®E - Introduction to Power Flow and Steady State Analysis – NERC*	\$2,365
7/18/11-7/22/11 (4.5 Days)	PSSC550	PSS®E - Introduction to Dynamic Simulation	\$2,695
7/25/11-7/29/11 (4.5 Days)	PSSC710	PSS®E – Advanced Power Flow	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due May 1, 2011)			\$8,882.50

Fall 2011 Session

Associate Certificate in Power Systems Technology – 9.9 CEUs

Dates	Course ID	Course Name	Price
9/7/11-9/9/11 (3 Days)	PSEC515	Introduction to Project Management for Power System Engineers	\$2,365
9/12/11-9/16/11 (4.5 Days)	PDEC500	Introduction to Distribution Systems and Power Circuit Analysis – NERC	\$2,695
9/19/11-9/23/11 (4.5 Days)	PSEC505	Power Flow Analysis with Applications – NERC	\$2,695
9/26/11-9/30/11 (4.5 Days)	PTEC500	Fundamentals of Overhead Transmission Line Design	\$2,695
Subtotal			\$10,450
Less %15 Prepay Certificate Discount			-\$1,567.50
Total Tuition (Due July 1, 2011)			\$8,882.50

Continuing Education Units

Additionally, courses offered by Siemens Power Academy TD- NA are eligible for Continuing Education Units (CEUs) and Professional Development Hours (PDHs). At the request of the student, Siemens Power Academy will provide the necessary documentation indicating the number of CEUs or PDHs to be awarded based on the instructional hours completed.

Continuing Education Units (CEUs) is the nationally recognized unit for recording participation in professional development and noncredit educational programs. Professional Development Hours (PDHs) are the continuing education unit of measure used by Professional Licensed Engineers (PE) to maintain licensure requirements. Participants earn one PDH for each one hour of instruction. The participant is responsible for maintaining records of courses taken in support of licensure.

IEEE members receive 10% discount

As an IEEE member, you are eligible to receive a 10% discount off our regular tuition price for courses within your certification program. Contact us for details.

Continuing Education Units (CEUs), Professional Development Hours (PDHs) and NERC Continuing Education Hours (CEHs)

Licensed engineers, on a voluntary or mandated basis, attend continuing professional education for licensure

renewal to ensure competency. All courses offered through Siemens Power Academy TD – NA meet the requirements for CEUs and PDHs. Many courses qualify for CEHs as well.

Continuing Education Units (CEUs)

The CEU is the nationally recognized unit for recording participation in professional development and noncredit educational programs. Participants completing this course will be awarded CEUs based on the instructional hours of the course; one CEU is awarded for ten (10) classroom hours of instruction.

Professional Development Hours (PDHs)

Continuing professional education for licensed Professional Engineers (PEs) is measured in PDHs; for all of our instructor-led training courses participants earn one PDH for each one classroom hour of instruction. Participants are responsible for maintaining records of courses taken in support of licensure.

NERC Continuing Education Hours (CEHs)

Siemens Power Academy TD – NA is recognized by the [North American Electric Reliability Corporation](#) as a continuing education provider who adheres to NERC Continuing Education Program criteria. Many of our courses qualify for NERC CEHs. Please contact our office if you would like more information on NERC-approved courses.



Convenient training locations

Siemens Power Academy TD – NA provides scheduled training at the following offices:

- Burlington, Ontario Canada
- Houston, TX USA
- Littleton, CO USA
- Minnetonka, MN USA
- Mountain View, CA USA
- Orlando, FL USA
- Schenectady, NY USA
- Or at Your Company

Contact us for details or to request a training quotation.

Contact us

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descriptions of the technical options available, which
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The required technical options should therefore be
specified in the contract.

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