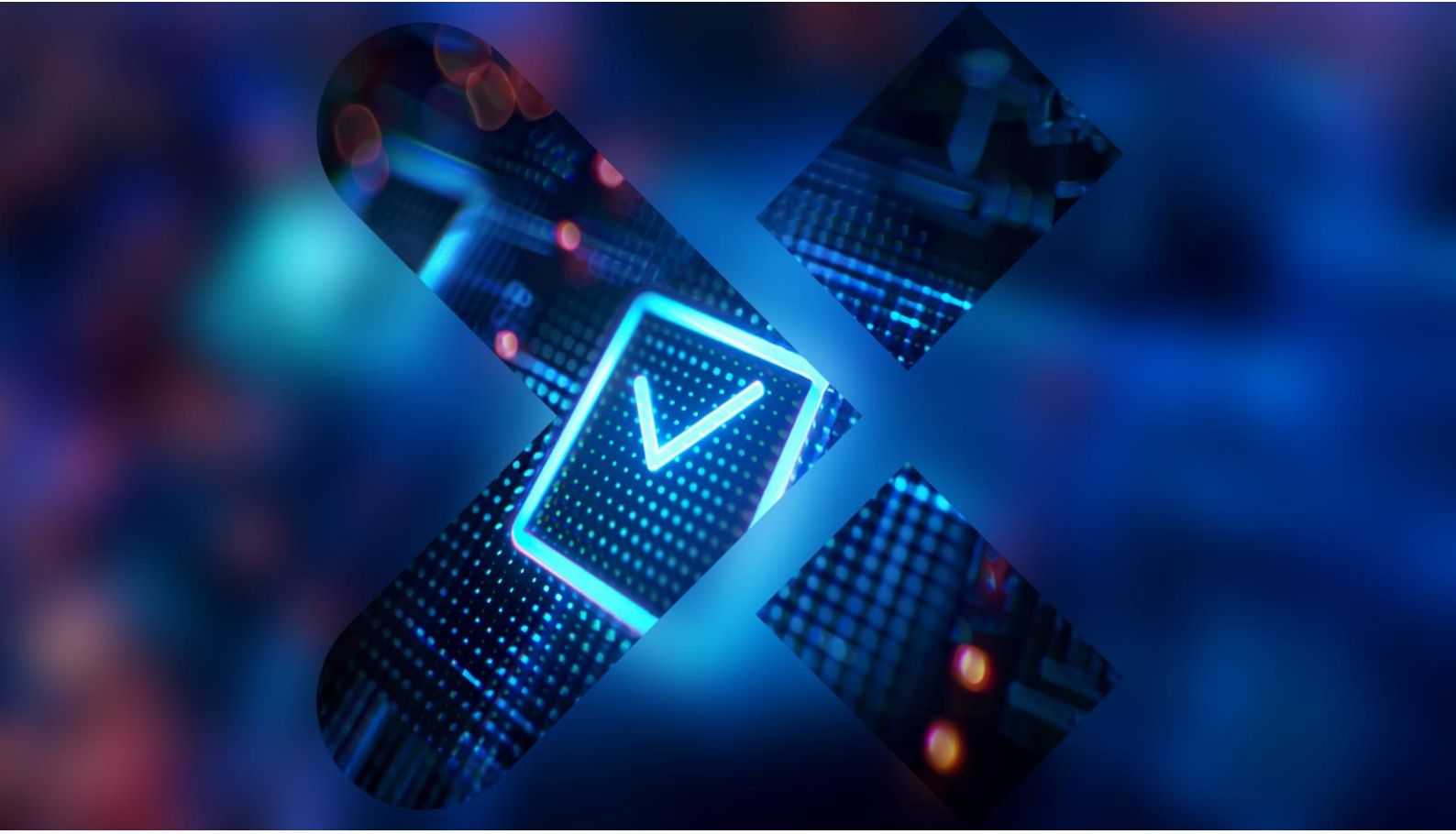

GRID SOFTWARE UNIVERSITY

PSSE

Course Catalogue

Document: GSW-U-PTI-Course-Objectives

SIEMENS

Contents

1. PSSE Training

1.1 Introduction

PSSE (Power System Simulation for Engineering) is a comprehensive software package developed by Siemens that is widely used in the power industry for modeling, analyzing, and optimizing power systems. As the electric grid becomes more complex with the integration of renewable energy sources, distributed generation, and smart grid technologies, proficiency in using tools like PSSE is increasingly crucial for power systems engineers and analysts.

1.2 Training Program

PSSE training programs are designed to equip power professionals with the skills and knowledge needed to effectively leverage this industry-standard software for a variety of applications, including:

Power Flow Analysis: Participants learn how to perform load flow studies, identify voltage and line loading issues, and optimize power flow within the grid.

Transient Stability Assessment: The training covers techniques for analyzing the dynamic behavior of power systems, allowing engineers to assess the stability and security of the grid during disturbances.

Fault and Contingency Analysis: Trainees gain the ability to conduct short-circuit studies, evaluate the impact of equipment failures, and develop mitigation strategies to enhance grid resilience.

Renewable Integration: PSSE training explores methods for modeling and integrating renewable energy sources, such as wind and solar, into power system simulations.

1.3 Language

Our courses are available in English. You can see the available languages in the general information section of each specific course. For classes in any other language, an interpreter might be necessary, and course customization charges might apply. Customers with language translation requirements should contact Siemens Training Department.

1.4 Delivery Methods

Our courses are available via multiple delivery methods:

Classroom	Instructor-led training session at a formal classroom setting at Siemens
Remote	Live, Instructor-led training session given via online conferencing tools
On-Site	Instructor-led training session provided at the customer facility in a training environment supplied by the customer
eLearning	Pre-recorded training session provided on demand
On-The Job	Execute tasks and get hands-on experience, under the supervision of a trainer

You can see the available Delivery Methods in the general information section of each specific course.

1.5 Training Material

Training materials are specifically developed for PSSE training courses. Siemens shall provide all necessary training materials, including course manuals and reference material in PDF (Portable Document Format) files. Each trainee shall receive individual copies of the training materials. The contents of PSSE training materials are confidential and proprietary, and usage is protected by Siemens copyright and to be used by course participants only.

1.6 Course registration and Contact information

Registration requests should be submitted to the Training Center no later than 15 business days prior to the scheduled begin date of any class. To ensure adequate delivery of the course contents, enrollment in many of the classes is limited. Seating for classes is reserved in the order that requests are received.

For registration, or if you want to get more information about our courses or have special training requests, please reach out to your local Siemens sales partner, or contact us directly at gridsoftware-training@siemens.com

1.7 Cancellation Policy

Siemens may cancel classes with less than the minimum of five (5) registered students, no less than two weeks prior to the scheduled start of that class. Any enrolled students would be notified of the cancellation and optionally rescheduled for a later offering.

Customer cancellation of student enrollments received less than two weeks prior to the start of the class will be subject to a cancellation fee equal to 50% of the tuition. If an enrolled student fails to appear for a scheduled class, a cancellation fee equal to 100% of the tuition will be charged.

2. PSSE Power Simulator Course Objectives

This Course Catalogue has everything for your customer to get started using PSSE.

2.1 Power Flow and Steady State Analysis Using PSSE

Objectives

This course is designed to familiarize new users with the Power Flow and Fault Analysis features of the PSSE program. Upon completion of this course, new PSSE users will be acquainted with most program functions in sufficient detail for them to begin study work relevant to power flow, fault analysis and other types of steady state analysis.

General Information

Course Code	PSSC_500
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

New users of the Power Flow and Fault Analysis features of the PSSE program.

Roles: Power system engineers

Prerequisites

It is recommended to take PSSE-TUT-INTRO Beginner PSSE Training using Version 35 as a prerequisite to attending the full formal course.

Content

- PSSE Overview
- How to Get Started
- Understanding the Power Flow Solution
- Data Addition and Modification
- Toolbars and Diagrams
- Power Flow Solution Difficulties
- Program Automation
- Contingency and Transfer Limit Analyses
- Balanced Switching
- Fault Analysis
- Data Management
- Special Applications (viz., PV/QV)
- Study Projects
- PSSE Cloud
- Post Course Information

2.2 PSSE - Voltage Control & Reactive Power Planning Methods

Objectives

The PSSE – Voltage Control and Reactive Power Planning Methods course provides a thorough coverage of today's voltage control and reactive power planning issues, and of the tools and procedures that are most effective in studying them.
Upon completion of this course, the participant will have a working knowledge of voltage control issues and reactive power planning using PSSE.

General Information

Course Code	PSSC_510
Delivery Method	Classroom, Remote, On-Site
Duration	4.5 Days
Language	English
CEUs	2.7
PDHs	27

Target Audience

Users of the corresponding program module(s).
Roles: Power system engineers

Prerequisites

- PSSC_500 Power Flow and Steady State Analysis Using PSSE or the equivalent experience.

Content

- Overview
- Equipment Voltage Characteristics
- Load Voltage Characteristics
- Bulk System Operations and Voltage Characteristics
- Reactive Power Planning Issues
- Other Voltage Issues
- Analytical Tools and Methods

2.3 Fast Track Introduction to Steady State & Dynamics Using PSSE

Objectives

This is an intensive hands-on course for power system engineers interested in learning the basic functions of PSSE Power Flow and Dynamics in a condensed format. It will help users get started with power flow data entry, solution and report, and apply data-checking functions in PSSE to identify power flow modeling issues. In addition, participants will understand how to set up a dynamic simulation database in PSSE, perform simulations of different types of disturbances and produce plots of key variables for analyzing transient and dynamic stability behaviors of the power system. Upon completion of the course, participants will be able to immediately begin study work using PSSE for steady state and dynamics analyses.

General Information

Course Code	PSSC_525
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

Users of the corresponding program module(s).

Roles: Power system engineers

Prerequisites

General knowledge of the power system, symmetrical component theory of poly-phase systems, fundamentals for modeling power plant equipment and network protection systems in the dynamic simulation timeframe is expected.

Content

- Learn the essentials of PSSE Power Flow, including data categories, data entries and modifications, solution algorithms, and tabulated and graphical reports
- Become familiar with different components of the Graphical User Interface, including toolbars, network tree diagrams, plots and report windows
- Employ data checking functions to identify suspicious modeling parameters
- Use program automation tools to facilitate calculation and reporting tasks
- Understand the basic procedures of automatic contingency analyses and transfer limit calculations
- Learn the steps in balanced switching calculations
- Explore fault analysis basics, including system modeling, setup and calculation options
- Understand the method used within PSSE to perform dynamic simulation
- Learn how to prepare a dynamic simulation database, check data, perform simulations of system disturbances, and plot results of key variables.

2.4 Dynamic Simulation Using PSSE

Objectives

An intensive hands-on course, designed to familiarize new users with the Dynamic Simulation features of the PSSE program, and to explore how different types of disturbances can cause systems to behave in certain ways through analysis of system response outputs from PSSE dynamic simulations.

Upon completion of this course, PSSE users will be acquainted with the commonly used program functions in sufficient detail for them to begin study work involving dynamic simulations.

General Information

Course Code	PSSC_550
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

Users of the corresponding program module(s).
Roles: Power system engineers

Prerequisites

It is recommended to take PSSC-500 Power Flow and Steady State Analysis and PSSE-400 E-Learning - Introduction to Dynamics prior to attending this course.

Content

- PSSE Overview
- Dynamic Simulation Setup
- Data Checking Overview
- Basic Simulation Procedures
- PSSPLT
- Simulation Options
- PSAS And Auxiliary Programs
- Adding Models To Existing Setup
- Relay Modeling In Dynamic Simulation
- User-written Models
- Extended Term Simulations
- PSSE Utilities
- Data Management
- Data For Problems
- Post Course Information

2.5 Optimal Power Flow Using PSSE

Objectives

Finding the optimal reactive power compensation for certain circumstances can be quite a challenge. As a powerful, yet easy-to-use, network analysis tool, PSSE OPF simultaneously solves power flow equations while optimizing system controls within constraints to meet a specified objective, such as reactive power compensation. By attending this course, and with the help of PSSE OPF, participants will be able to analyze and resolve a variety of transmission system problems.

General Information

Course Code	PSSC_570
Delivery Method	Classroom, Remote, On-Site
Duration	3 Days
Language	English
CEUs	1.8
PDHs	18

Target Audience

The training is intended for: Engineers and service technicians who work in operation, planning and design of power systems
Roles: Power system engineers

Prerequisites

Participants should be familiar with the basic operation of the PSSE load flow program.
Understanding of network analysis applied to transmission system problems

Content

- This course provides participants the knowledge required to resolve the power flow equations while optimizing system controls within constraints to meet a specified objective. With the help of PSSE OPF, the engineer can analyze a variety of transmission system problems present in today's rapidly changing environment.

2.6 Automating PSSE Using Python

Objectives

In this course, participants will learn the basics of the Python language and how to automate PSSE using the Python APIs. Upon completing this course, participants will have the tools they need to start writing Python programs and driving PSSE from Python. Participants with stronger programming and PSSE skills will be able to make their processes more powerful and efficient.

General Information

Course Code	PSSC_625
Delivery Method	Classroom, Remote, On-Site
Duration	4 Days
Language	English
CEUs	2.4
PDHs	24

Target Audience

Users of the corresponding program module(s).

Roles: Power system engineers

Prerequisites

Basic familiarity with PSSE

Beneficial to have prior programming and PSSE skills

Content

Topic 1 – Introduction

- Why learn Python?
- How to use Python run PSSE?
- CLI of PSSE

Topic 2 – IDEs and Debugging

- IDLE, Visual Studio Code, PyCharm, Others
- Setting Breakpoints and Stepping Through Code

Topic 3 – Python Language Overview

- Basics
- What is an Exception?
- Variables and Data Structures
- Control Flow Tools
- Input and Output
- Functions, Modules
- Exception Handling

Topic 4 – Objects and Classes

- Classes
- Python objects
- Inheritance

Topic 5 – JSON and RAWX Processing

- JSON, XML
- What is RAWX?

Topic 6 – PSSE Python Interface

- API manual and getting help(..)
- redirect Module
- psspy Module
- Record and Playback PSSE automation.
- Retrieving and Changing Network Data

Topic 7 – PSSE Data/Results Post Processing

- arrbox Module
- pssexcel Module

Topic 8 –Other PSSE Modules

- Short Circuit Calculations
- Dynamic Simulation
- PSSPLOT
- dyntools Module
- CASPY

Topic 9 – GUI with Tkinter - Example

2.7 Advanced Power Flow Using PSSE

Objectives

Utility engineers who conduct studies with PSSE must understand the fundamental concepts of power system behavior as well as know how to execute the many advanced routines within the program. This course is directed at the experienced PSSE user who would like to increase his or her analytical skills in steady state applications.

Program users will be able to perform advanced steady state analyses with ease upon completion of the PSSE – Advanced Power Flow and Steady State Analysis Using PSSE course.

General Information

Course Code	PSSC_710
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

Experienced PSSE user who would like to increase his or her analytical skills in steady state applications

Roles: Power system engineers

Prerequisites

Experienced with PSSE

Understanding of steady state applications

It is recommended to take PSSC-500 Power Flow and Steady State Analysis Using PSSE prior to attending this course

Content

- Basic Power Flow Review
- Transformer Modeling
- Contingency Analysis
- Preventive Security Constrained OPF
  - (PSCOPF and N-1-1 Analysis)
- Reliability Assessment
- Program Automation
- Power Flow Solution & Voltage Analysis
  - (FACTS Devices)
- Modeling FACTS Devices in Power Flow
  - (Voltage Analysis)
- Optimal Power Flow
- GIC Calculations
- Post Course Completion Information

2.8 Advanced Dynamic Simulation for PSSE

Objectives

This course is designed for experienced engineers interested in learning advanced analysis of system stability and dynamics. Examples and exercises focus on dynamic modeling of components such as synchronous generators, excitation systems, prime movers, wind turbines, HVDC and FACTS devices, and loads. Upon completion of this course, participants will have the knowledge and the ability to incorporate the advanced dynamic simulation capabilities of PSSE into the analysis of their power system

General Information

Course Code	PSSC_715
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

Experienced PSSE user who would like to increase his or her analytical skills in steady state applications

Roles: Power system engineers

Prerequisites

- Participants must be employees of a company that is a current lessee of PSSE.
- They should have operating experience using the PSSE power flow and dynamic simulation modules, or they should have completed both of the
    - "PSSC 500 – Power Flow and Steady State Analysis using PSSE" and
    - "PSSC 550 – Dynamics Simulation using PSSE" courses.

Content

In PSSC 715 participants will:

- Refresh their knowledge of mathematical modeling tools (Laplace transform, transfer functions and block diagrams) and classical control techniques (transient and frequency response and numerical integration)
- Review power system dynamics
- Understand appropriate analytical software tools used for evaluating dynamic phenomena
- Understand the classifications of power system stability necessary to determine meaningful practical analysis
- Explore methods for solving stability problems
- Understand the process, setup procedures and classification of variables in dynamic simulation
- Perform data checking functions, including checking of excitation system and turbine governor model response
- Understand the basics of excitation system tuning
- Learn about dynamic modeling of power plant components, including synchronous machines, excitation systems, turbines and speed governors
- Learn how to simulate complex disturbances
- Use program automation to streamline the dynamic simulation
- Explore modeling of relays, HVDC systems, FACTS, loads and induction motors
- Study voltage collapse and dynamic voltage support and recovery
- Develop and incorporate user-written models into PSSE
- Learn how to perform modal analysis using PSSPLT.

2.9 Introduction to Model Writing in PSSE

Objectives

Introduction to Model Writing course provides participants with an introduction to the practical and theoretical aspects of dynamic modeling using PSSE. In this interactive course, participants will gain a basic understanding of user-defined models.

Upon completion of this course, participants will understand dynamic simulation objectives and requirements and will be able to use this knowledge to develop their own models in PSSE.

General Information

Course Code	PSSC_718
Delivery Method	Classroom, Remote, On-Site
Duration	3 Days
Language	English
CEUs	1.8
PDHs	18

Target Audience

Roles: Power system engineers

Prerequisites

Participants should have either, setup and operating experience with power flow and dynamic simulation of power systems, or should have completed all introductory courses in PSSE.

Content

In this course, participants will:

- Understand the landscape of dynamic simulation and disturbances on the power system
- Explore the disturbance phenomena and the limitations of simulation tools
- Discuss dynamic simulation objectives and the need for user-defined models
- Understand the overall flow of dynamic simulation within PSSE
- Understand the process of compile and link, and the differences between object and library (“obj” and “lib”) files versus “dll” files
- Discuss “dll” creation process, advantages of using a “dll” as opposed to “obj” and “lib” files
- Understand the development requirements for a user-written model
- Learn how to determine the starting values of CON, STATE, VAR, and ICON indices for various models
- Learn the DYRE entry format for various user-written models
- Learn to simplify the process of writing PSSE dynamic models by building elementary blocks for handling various transfer functions
- Write PSSE dynamic models for simple models like AVR, and turbine governors. Refresh their knowledge of mathematical modeling tools (Laplace transform, transfer functions and block diagrams) and classical control techniques (transient and frequency response and numerical integration)

2.10 Advanced Model Writing in PSSE

Objectives

The Advanced Model Writing course equips participants with knowledge in both practical and theoretical aspects of dynamic modeling using PSSE. In this hands-on course, participants will have an opportunity to write several user-defined models.

Upon completion of this course, participants will understand dynamic simulation objectives and requirements and will be able to use this knowledge to develop their own models in PSSE.

General Information

Course Code	PSSC_720
Delivery Method	Classroom, Remote, On-Site
Duration	5 Days
Language	English
CEUs	3.0
PDHs	30

Target Audience

Roles: Power system engineers

Prerequisites

PSSC_718 - Introduction to Model Writing in PSSE, or equivalent experience.

Content

- User Model code Template
- Dynamic Simulation Overview
- DYRE Format for user-written models
- Model Writing Details & Exercises
- Interactive Debugging Tools
- Wind Machine Model Writing Exercises
- CCT Type Model Writing Exercises
- FACT Model discussion
- Conclusions (Model Writing)

2.11 Introduction to PSSE GIC Module

Objectives

Geomagnetic Disturbances (GMDs) occur when solar energetic particles from the sun migrate to the earth and cause short-term variations in the earth's magnetic field. These variations can eventually lead to Geomagnetically Induced Currents (GICs) and a potential increase in var losses and harmonic distortion that may lead to voltage stability problems. The objective of the PSSC 800 course is to provide participants with an introduction to the GIC module in PSSE, the theory of GIC, and the configuration and operation of the module.

Upon completion of this course, participants will have a fundamental understanding of GIC theory and basic knowledge to perform GIC studies using PSSE.

General Information

Course Code	PSSC_800
Delivery Method	Classroom, Remote, On-Site
Duration	1 Day
Language	English
CEUs	0.6
PDHs	6

Target Audience

Roles: Power system engineers

Prerequisites

Participants must be employees of a company that is a current lessee of PSSE. Be an experienced PSSE user with advanced knowledge of power systems. Participants must complete the PSSE GIC Introduction course before taking the PSSE GIC Workshop.

Content

PSSE GIC Introduction (Day 1) participants will:

- Understand the theory of GIC phenomena, characteristics, calculations and model
- Explore the PSSE GIC data file
- Learn how to set up GIC data and configure settings in PSSE
- Learn how to run a GIC simulation in PSSE
- Understand how to access and interpret results and plots in PSSE
- Review a sample study and the results obtained

2.12 Introduction to PSSE GIC Workshop

Objectives

Geomagnetic Disturbances (GMDs) occur when solar energetic particles from the sun migrate to the earth and cause short-term variations in the earth's magnetic field. These variations can eventually lead to Geomagnetically Induced Currents (GICs) and a potential increase in var losses and harmonic distortion that may lead to voltage stability problems. The objective of the PSSC 800 course is to provide participants with an introduction to the GIC module in PSSE, the theory of GIC, and the configuration and operation of the module. PSSC 810 is a hands-on workshop during which the instructor will review and discuss the participants' actual PSSE GIC models.

Upon completion of this course, participants will have a fundamental understanding of GIC theory and basic knowledge to perform GIC studies using PSSE. Participants will also be able to perform GIC studies on their own system to prepare for the next solar flare.

General Information

Course Code	PSSC_800_810
Delivery Method	Classroom, Remote, On-Site
Duration	2 Days
Language	English
CEUs	1.2
PDHs	12

Target Audience

Roles: Power system engineers

Prerequisites

Participants must be employees of a company that is a current lessee of PSSE. Be an experienced PSSE user with advanced knowledge of power systems. Participants must complete the PSSE GIC Introduction course before taking the PSSE GIC Workshop.

Content

PSSE GIC Introduction (Day 1) participants will:

- Understand the theory of GIC phenomena, characteristics, calculations and model
- Explore the PSSE GIC data file
- Learn how to set up GIC data and configure settings in PSSE
- Learn how to run a GIC simulation in PSSE
- Understand how to access and interpret results and plots in PSSE
- Review a sample study and the results obtained

PSSE GIC Workshop (Day 2) the instructor will:

- Review the participant's GIC data model
- Review the results obtained from the model
- Resolve any data errors
- Lead a question and answer session.

2.13 PSSE V35 Fundamentals: Introduction to Power System Studies

Objectives

This online training tutorial is an introduction to Version 35 of PSSE. The tutorial is divided into six modules, designed to prepare new users with the tools to begin running studies in PSSE.

General Information

Course Code	psse-tut-intro
Delivery Method	E-Learning
Duration	2.5 Hours
Language	English
CEUs	0.25
PDHs	2.5

Target Audience

This course is designed to prepare new users with the tools to begin running studies in PSSE

Roles: Power system engineers

Prerequisites

Familiarity with power system simulation software is recommended but not mandatory.

Content

1 - Basic System Modeling (40 mins)

2 - Power Flow Solution (13 mins)

3 - Changing Network Topology (20 mins)

4 - Program Automation (22 mins)

5 - AC Contingency Analysis (20 mins)

6 - Merging Cases (15 mins)

2.14 PSSE V36 - Time Series Power Flow Module

Objectives

This course introduces the Time-series Power Flow add-on module, a powerful tool that enables planning engineers to enhance the accuracy of short-term planning decisions, specifically in outage planning and operations planning. Through a combination of theoretical concepts and practical hands-on exercises, participants will learn how to leverage this module to unlock valuable insights and optimize their planning processes.

General Information

Course Code	PSSE-TUT-TSPF
Delivery Method	E-Learning
Duration	1.2 Hours
Language	English
CEUs	0.1
PDHs	1.0

Target Audience

This course is designed for planning engineers, power system analysts, and professionals involved in short-term planning and analysis in the energy sector. It is suitable for individuals seeking to enhance their skills in incorporating time-series data into planning studies and improving the accuracy of short-term planning decisions
Roles: Power system engineers

Prerequisites

Participants should have a basic understanding of power system planning concepts and experience with power flow analysis. Familiarity with power system simulation software is recommended but not mandatory.

Content

Course Highlights:

- Understanding the Limitations of Traditional Short-Term Planning: Explore the shortcomings of relying solely on static peak and off-peak data and the need for more dynamic and comprehensive approaches.
- Introduction to Time-Series Data: Gain a solid understanding of time-series data and its significance in capturing the dynamic behavior of the grid. Learn how to define detailed load and generation profiles for any desired time interval, ranging from minutes to hours or days.
- Automation and Streamlining: Discover how to automate the creation of multiple cases, enabling the generation and analysis of hundreds of thousands of power flow solutions efficiently.
- Intelligent Post-Processing Techniques: Learn advanced post-processing techniques to identify revealing trends and outliers within time-series data. Pinpoint worst-case scenarios for further analysis and prioritize critical areas of the grid.
- Real-World Applications and Case Studies: Apply the concepts and techniques learned in real-world scenarios through interactive case studies. Gain hands-on experience in using the Time-series Power Flow add-on module to solve complex planning problems.

2.15 PSSE V35 Training Course

Objectives

To become familiar with the features available in PSSE Version 35

General Information

Course Code	tut-psse-v35
Delivery Method	E-Learning
Duration	1.2 Hour
Language	English
CEUs	0.1
PDHs	1.2

Target Audience

This course is designed to prepare new users with the tools to begin running studies in PSSE

Roles: Power system engineers

Prerequisites

Familiarity with power system simulation software is recommended but not mandatory.

Content

Five videos covering PSSE updates:

- PSSE V35.0
- PSSE V35.1
- PSSE V35.2
- PSSE V35.3-35.4
- PSSE V35.5-35.6

2.16 PSSE V36 Training Course

Objectives

Get to know the features available and how to use them in the PSSE V36 Training Course. We will cover each major point release highlighting the new features and modules along with a demonstration in PSSE showing how to use them.

The class will be updated with each new feature released. You will only need to purchase this class once to receive all of the future modules.

General Information

Course Code	Tut-PSSE-V36
Delivery Method	E-Learning
Duration	1+ Hours
Language	English
CEUs	---
PDHs	---

Target Audience

Roles: Power system engineers

Prerequisites

Familiarity with power system simulation software is recommended but not mandatory.

Content

The class will be updated with each new feature released. You will only need to purchase this class once to receive all of the future modules.

- PSSE V36 (Study Projects)
- PSSE V36 (Slider Diagrams)
- PSSE V36 (Study Projects Manager)

2.17 PSSE-400 - Introduction to Dynamics

Objectives

This e-learning course provides a foundational understanding of dynamic simulations using PSSE (Power System Simulator for Engineering), a leading software tool for power system analysis. Designed for engineers, students, and industry professionals, this course covers key concepts such as dynamic simulation setup, procedures, and disturbances. Through interactive lessons and exercises, students will gain practical skills in setting up, running, and interpreting dynamic simulations to analyze system behavior under various operating conditions and disturbances.

General Information

Course Code	psse_400-tut
Delivery Method	E-Learning
Duration	5 Hours
Language	English
CEUs	0.5
PDHs	5.0

Target Audience

-Power system engineers

-Grid operations and planning staff

-Technical professionals new to PSSE or dynamic studies

Prerequisites

-Basic familiarity with power system fundamentals

-Prior exposure to PSSE load flow studies is helpful but not required

Content

- Module 1 - Introduction to Dynamics – 119 mins (~2 hours)
- Part 1 - An overview of course material, dynamic simulation, models, and procedures. (51 minutes)
- Part 2 - Examines the differences in generator model types, along with breaking down the logic and expanded procedures within the dynamics PSSE module. (36 minutes)
- Part 3 - Final setup parameters, example cases, and common mistakes to avoid. (33 minutes)

- Module 2 - Basic Simulation Procedures – 84 mins (~1 hours 30 mins)
- Part 1 - An overview of workflow, menus, and tools for performing simulations. (31 minutes)
- Part 2 - This part details suspect conditions, data checking during initializations, and how to correct bad data. (35 minutes)
- Part 3 - Running a simulation in line command mode, and defining disturbance model simulations. (19 minutes)

- Module 3 - Example Exercise – 56 mins (~1 hour)
- A - Example exercises. (32 minutes)
- B - Example wrap-up. (24 minutes)

- Module 4 - Dynamic Disturbance Simulation – 27 mins (~0.5 hour)
  Facts about dynamic disturbances, balanced vs unbalanced fault simulation, and a final example exercise. (27 minutes)

2.18 PSSE V36 - Voltage Droop Control

Objectives

The Voltage Droop Control module in PSSE (Power System Simulation for Engineers) allows users to analyze and model voltage droop control in power systems. This course will provide an in-depth understanding of voltage droop control, including its application and impact on power flow solutions.

General Information

Course Code	psse-tut-vdc
Delivery Method	E-Learning
Duration	1 Hours
Language	English
CEUs	0.1
PDHs	1.0

Target Audience

This course is designed for planning engineers, power system analysts, and professionals involved in short-term planning and analysis in the energy sector. It is suitable for individuals seeking to enhance their skills in incorporating time-series data into planning studies and improving the accuracy of short-term planning decisions

Roles: Power system engineers

Prerequisites

- Familiarity with power system simulation software is recommended but not mandatory.

Content

- Reviewing the voltage setpoint and band controls in power flow solution
- Discussing the voltage droop control
- Modeling the voltage droop control and analyzing the power flow results
- Discussing the application notes of voltage droop control

Upon completion participants will be able to perform simulations and analyze power flow results with voltage droop control.

2.19 Harmonic Analysis Using PSSE

Objectives

Participants will learn about the algorithms used for harmonics calculations and gain insights into the post-processing of results for both harmonics frequency scans and harmonics distortion. The course also delves into running harmonics analysis from Python, allowing participants to leverage the power of scripting for their analysis.

General Information

Course Code	PSSE-TUT-HMCS
Delivery Method	E-Learning
Duration	1.2 Hours
Language	English
CEUs	0.1
PDHs	1.2

Target Audience

This course is designed for power system engineers, researchers, or students. It will equip learners with the necessary knowledge and skills to perform harmonics analysis effectively using PSSE. By the end of the course, you will have a solid understanding of harmonics analysis principles, techniques, and applications, enabling you to confidently apply them in your professional endeavors.

Roles: Power system engineers

Prerequisites

- Familiarity with power system simulation software is recommended but not mandatory.

Content

- The course covers various aspects of harmonics analysis, including documentation, examples, calculations, limits based on applicable standards, APIs for calculations, and data and models based on CIGRE TB 766.

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