Electrical Learning Portal

Advance PSCAD

Live Training

ENGINEERS' CERTIFICATION PROGRAM

Engineering Skills

At Electrical Learning Portal (ELP), we are dedicated to shaping the future of the electrical and MEP (Mechanical, Electrical, and Plumbing) industries through professional training and development. Our mission is to bridge the gap between the ever-evolving needs of employers and the dynamic skill set of engineers by providing comprehensive, industry-relevant education and training.

Degree + Skills = Career Growth

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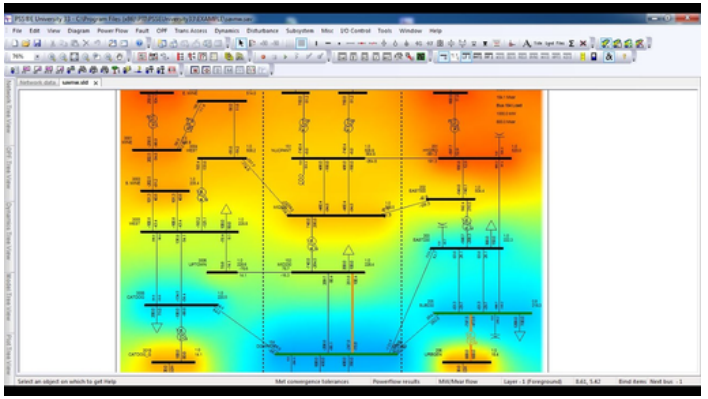
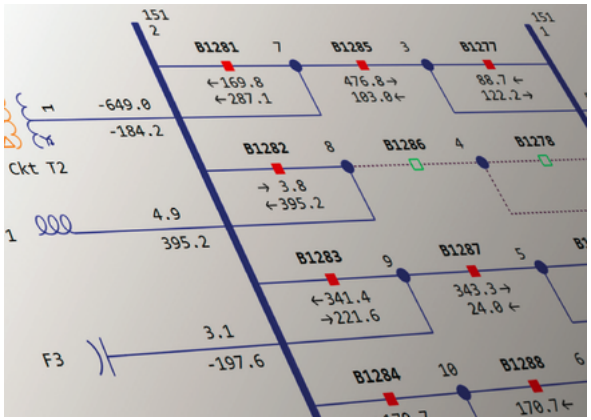
POWER SYSTEMS COMPUTER AIDED DESIGN (PSCAD ADVANCE)

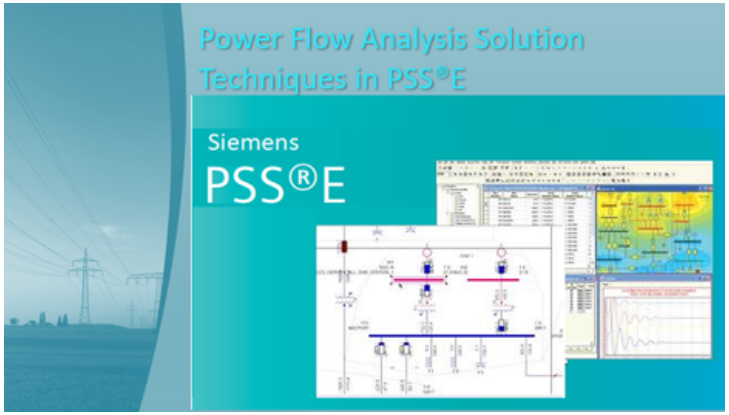
Comprehensive Power System Simulation and Transient Studies using PSCAD is an advanced, practice-oriented training program designed to equip power system engineers and technical professionals with in-depth skills in electromagnetic transient (EMT) simulations using the PSCAD software platform.



Starting from the fundamentals of PSCAD interface and EMT simulation principles, the course progressively covers real-world modeling of power system components such as sources, loads, cables, transformers, breakers, and surge arresters. Participants will build and analyze complete power system models and explore a wide range of scenarios including fault analysis, transformer energization, load rejection, and transient recovery voltages.



In the advanced modules, the course dives deep into high-impact system studies such as Temporary Overvoltage (TOV), Switching Frequency Overvoltage (SFO), Fast Front Transients, Very Fast Transient Overvoltage (VFTO), and ferroresonance phenomena, with case-based simulations and project-level study design.



By the end of the course, participants will have the capability to confidently conduct EMT studies for grid-connected systems, renewable integration, protection design, and high-voltage applications using PSCAD.

TOPICS

Module 1: Fundamentals of EMT Simulation and PSCAD Interface

- *EMT vs Steady State vs Transient Stability studies*
- *Overview of simulation tools (PSCAD vs others)*
- *PSCAD workspace orientation: case/project creation, libraries, saving/loading*
- *Simulation settings: time step, duration, plot step*

Module 2: Network Modeling and Measurement Tools

- *Using the master library*
- *Building basic networks and subsystems*
- *Using meters, probes, and plotting results*
- *Simulation execution and result validation techniques*

Module 3: Source and Load Modeling

- *Source types: AC/DC, Thevenin equivalent, 3-phase with harmonics*
- *Source impedance: actual, per unit, and sequence-based*
- *Load modelling:*

1. *Voltage-dependent*
2. *Constant power/current/impedance*
3. *Polynomial, exponential, and frequency-dependent loads*

Module 4: Fault and Breaker Modelling

- *Breaker modeling (single/three-phase)*
- *Creating faults: LG, LLG, 3-phase on bus, cable, and line*
- *Understanding protection logic in simulation*

Module 5: Transmission Line, Tower, and Cable Modelling

- *Line modelling: PI section, Bergeron model, frequency-dependent*
- *Transmission tower representation*
- *Cable types: Co-axial and pipe-type submarine cables*
- *Validation of line and cable models*

Module 6: Transformer and Reactive Equipment Modelling

- *Transformer modelling and parameter setup*
- *Validating transformer performance*
- *Shunt reactors, capacitors, induction machines*
- *Surge arrester integration and modelling*

Module 7: Temporary Overvoltage (TOV) Studies

- *Introduction and practical significance of TOV*
- *Ferranti effect and load rejection analysis*
- *Fault-induced TOV scenarios*
- *Surge arrester response and mitigation*
- *TOV-focused case studies*

Module 8: Switching Frequency Overvoltage (SFO) and Energization Studies

- *Multi-run feature in PSCAD*
- *Capacitor bank switching: energizing and de-energizing*
- *Cable and line energization*
- *Transformer energization/inrush current and remanence*
- *Reactor energization simulations*

Module 9: Fast Front and Transient Recovery Studies

- *Shielding failure and back flashover*
- *Lightning impulse modeling*
- *Breaker dynamics: restrike, failure, and TRV analysis*
- *Transient recovery voltage across breakers*

Module 10: Advanced Phenomena – VFTO and Ferroresonance

- *Ferroresonance: causes, modeling approach*
- *VFTO (Very Fast Transient Overvoltage) study*
- *GIS substation modeling*
- *Disconnector switch simulation*
- *Trapped charge scenarios and mitigation*

Module 11: Case Studies and Hands-On Practice

FEATURES

1. Live trainer interaction
2. Access to recorded sessions
3. Career counseling support
4. Weekly assignments

Tools

o All Classes are Live via Google Meet or Zoom
o MS PowerPoint slides
o Calculation on MS Excel
o PDF material

BENEFITS

1. Job-ready programs
2. Updated course content
3. ISO-certified completion certificate
4. PDF notes provided and supporting documents
5. 100% refund policy

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