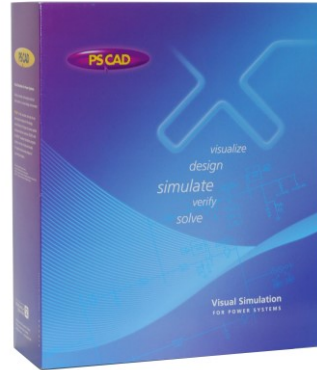


Fundamentals of PSCAD and General Applications

The Professional's Power Systems Transient Simulator



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Course Benefits

PSCAD X4 introduces the new era of toolsets for the simulation of electric power systems, distribution systems and power electronic systems. This course is designed to familiarize users with the general operation of PSCAD. With numerous hands-on examples, users will be able to develop proficiency with PSCAD X4 and its applications. While this course is aimed at new and novice users, the last 2 days of the course can be quite informative for most PSCAD users.

Modern power, distribution and electronic systems are becoming increasingly complex. Traditional single frequency based study and design software is unable to deliver the precision needed to confidently deliver the best engineering solution. This course will help increase your engineering skills in this rapidly developing and competitive world.

Course Outline: Four Days

Tutorials

Day 1: (9.00 am – 5.00 pm)

Introduction:

Concepts/Topics/Skills learned

About Nayak Corporation/HVDC Research Center
EMT/ Dommel's Algorithm
EMT Vs Steady State Vs Transient Stability
PSCAD/EMTDC structure
Selection of the simulation time step
Studies that require simulation tools

PSCAD Environment Overview and
PSCAD 4.6 New Features:

PSCAD menu options and features in the latest version

Tutorial 1 – Getting Started and Basic
Features of PSCAD:

Create, Save and Open cases
PSCAD Master Library and component ribbon tab
Modelling control
Modelling electrical circuit
Plots and meters
Plot data export

Tutorial 2 – Simple AC System:

Modeling three phase electrical circuit

Transformer model

- Saturation
- Transformer energization – Inrush Current

Single line and three phase view.

Interactive Input controls

Breaker model

Error debugging (compile and build errors, runtime errors)

Search and search results

Day 2: (9.00 am – 5.00 pm)

Tutorial 3 – Adding a Transmission Line:

Transmission line and cable model

- Transmission line data and solution methods
- Tower data
- Ground plane data
- Line constant outputs

Ferranti effect

Travelling wave

Subsystem splitting and parallel computing

Tutorial 4 – Induction Machine:

Induction Machine model

- Motor starting characteristics
- Voltage dips and sags
- Component Internal Output Variables

Modelling load torque using control blocks

PI section model for cabling

Fixed load model

Tutorial 5 – Development and Validation of an AC System Model for EMT Studies

- Voltage Source Initialization
- Load flow validation
- short circuit validation

Day 3: (9.00 am – 5.00 pm)

Tutorial 6 – Page Module and Multiple Run:

Page modules – Creating sub pages

Simulating AC System Faults

- Fault model
- Fault clearing
- Switching transients
- Breaker re-closing
- DC offset in fault current
- Point on wave impact

Batch Mode Simulations – Multiple Run Component

Snapshot feature - Start a case from pre-initialized settings

Voltage and current harmonic calculation

Black boxing page modules

Data arrays, merging and Tapping

Tutorial 7 – Synchronous Machine and Controls:

Synchronous machine model

- Start-up and initialization

Exciter, Governor and Turbine models
Custom generator controls
Power electronics devices
Gate pulse generation logic
Pulse width modulation
Single phase full wave rectifier
Harmonics

Tutorial 8 – Power Electronics:

Day 4: (9.00 am – 5.00pm)

Tutorial 9: Switching Studies:

Introduction to Switching Studies

- Switching Over Voltages
- Network Resonance

Surge Arrestor Model

Harmonic Impedance Scan

PSCAD Automation with Python Scripting

Tutorial 10 - Protection

Automated generation of a large number of fault waveforms in COMTRADE format for real time relay testing

Detailed current transformer (CT) saturation models

Modeling a simple relay scheme

Tutorial 11 – Custom Components:

Custom component design

- Gain Block
- Integrator Block

Computer Requirements

Please bring your own laptop for the hands-on workshop. The latest version of PSCAD professional Edition will be installed on your computer. Recommended system requirements:

- O/S supported: Vista SP1 or 7
- 8GB RAM or more of fast, high quality RAM
- Solid State hard drive
- 64 bit operating system
- MS TCP/IP network protocol installed (i.e. a network card must be installed)
- One USB 2.0 port
- Microsoft .NET Framework 4
- Microsoft Visual C++ 2010 Redistributables6
- GNU FORTRAN 95 compiler (Public License) (GFORAN 4.21 and 4.6.2) is included
- Optional Intel Visual Fortran

Cost

The course will cost US\$ 3,000 (US\$ Three Thousands) for the four days. We will provide tutorial notes with tutorial examples. The participants are required to bring their own laptop. Lunches are provided on site. Hotel accommodations and local travel are the responsibility of the participant.

Travel and Accommodation

Skillman is located equidistant from New York City and Philadelphia. The most convenient airports are Newark (EWR) and Philadelphia (PHL) airports. Please check the following links for local accommodations. Also, feel free to contact us if you need further assistance.

<https://www.hotelplanner.com/zip/Skillman-NJ-hotels-in-08558#dir-bar>

Cancellation

Since the course has significant hands-on content, the attendance is limited to 8 participants to allow maximum one-on-one interaction with the instructors. So please try to respond as soon as possible and reserve your place. The course may be cancelled if we do not have at least 4 participants. Students will be notified two weeks prior to commencement if the course is cancelled.



Fundamentals of PSCAD and General Applications

Course Date:

Enrollment

(Please fill out a separate form for each participant and fax, email or mail it to Nayak Corporation)

Name	
Title	
Company	
Mailing Address	
Phone	
Fax	
Email	

Payment

- A minimum enrolment is required. Students will be notified two weeks prior to commencement of the course is cancelled.
- All prices are in US Dollars
- All prices do not include any applicable sales taxes
- Terms of payment: Net 30 days from date of invoice
- Acceptable forms of payment are: Bank Draft, Money Order, Wire Transfer, Check or Credit Card.

Credit Card Authorization

Amount (Invoice Amount)	
Credit Card #	
Expiration Date	
Name on Card	
Billing Address with Zip	
CVV #	
Signature & Date	I agree to pay the total amount shown above in compliance with the card holder agreement