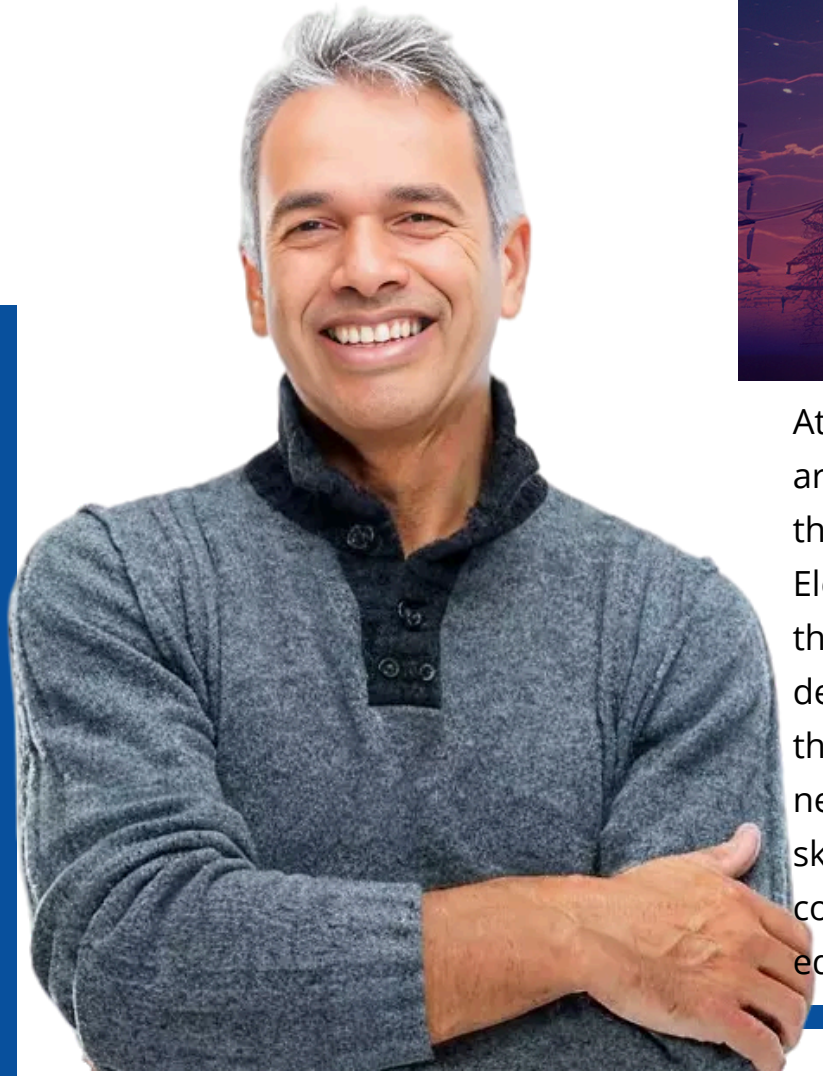
ELP ELECTRICAL LEARNING PORTAL

ENGINEERS' CERTIFICATION PROGRAM

Engineering Skills



POWER DISTRIBUTION SYSTEM DESIGN

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

CONTACT US

Electrical Learning Portal | ELP

+91-8430180594

info@electricallearningportal.com

https://electricallearningportal.com

POWER DISTRIBUTION SYSTEM DESIGNING | LIVE

This comprehensive online course is meticulously designed to provide working engineers with real-world experience in power system and substation design. It bridges the gap between theoretical concepts and practical applications, ensuring participants gain the skills needed to excel in their roles. From the basics of power systems and protection schemes to advanced design calculations, this course covers all aspects critical to modern electrical engineering. Topics include voltage class considerations, equipment selection, cable sizing, earthing systems, and the use of industry-standard tools like ETAP, AutoCAD, and MS Office.

With a strong focus on real-time project discussions and hands-on learning, this program addresses practical challenges engineers face in their daily tasks. Key highlights include insights into indoor and outdoor substation design (up to 220kV), GIS fundamentals, substation automation, PLCC, and MEP services for plants.

By the end of the course, participants will not only master essential design principles but also gain expertise in advanced topics such as relay coordination, lightning protection, and detailed SLD development. Join us to elevate your technical proficiency and stand out in the competitive field of electrical engineering!

TOPICS

Part 01- Power System & Substation Design Criteria

• Introduction

Introduction about Power Systems, Substation Types, Design Criteria, and Protection.

About Use of Tools details_ MS Office, ETAP, and AutoCAD

Single Line Diagram/One Line Diagram

• Protection Single line diagram Up to 415V/11kV to 220kV

o Power distribution & Study of Loads

o SLD From 132kV HV to LT MCC, Feeder types.

o CT/PT, Surge arrester, NGR selection.

o Ratings of Switchgear Selections.

o Main & Aux Protection Relay selections at HV/MV/LV.

o Bus bar selection/scheme.

o Relay/Release at LV.

o Basis of Busduct/Cable for LV

o Voltage levels at HV, MV and LV including control.

Voltage Level selection

• Voltage Classes and Considerations

o Extra High Voltage (EHV)

o High Voltage (HV)

o Medium Voltage (MV)

o Low Voltage (LV)

Codes and standards

• Purpose of Codes and Standards

o Overview of Key Codes and Standards

o Electrical Safety Standards

Part 02 Electrical project Engineering

Electrical project Engineering

o Review of Technical Contract documents

o About drawings List/Inspection & Test procedures etc.

o Input data for Substation design.

o Concepts about Basic Engineering Electrical & Calculations

o Concepts about Vendor Offers

o Concepts about Detail engineering

o Equipment Testing at Factory

o Site Installation/Testing & Commissioning.

Part 03 Electrical Power System & Substation Equipment's & Design Calculations.

Indoor Substations- 11kV to 33kV

o Introduction

o Power & Load Distribution.

o 11kV to 33kV Medium Voltage design

o VCB/VCU selection and technical details

o CT/PT details.

o Surge Arrester & Cables

o Protection & Control system.

Outdoor Substations Up to 220kV

o Introduction/Site condition/Single Line diagrams.

o Design Criteria

o Technical Details-LA/CB/Isolators/CT/PT/Insulators.

o Busbar Scheme (Single/Double/Transfer)

o Civil Inputs for Outdoor Substation.

o Equipment's Layouts/Sections & Clearances

o Control and Relay panels

o Protection & Control system.

Power, Distribution & Converter transformer

o Selection Criteria Power/Distribution & Converter Trafos)
o Sizing Calculation (Load Factor, Diversity Factors)
o Technical data sheets (Insulation/Impedance/Flux density/Losses)
o About Transformer Drawings.

Current Transformers

o Introduction/Type
o Protection CT classifications
o Metering CTs
o Design and construction considerations
o Terminal markings
o Specifications

Voltage Transformer

o Types
o rating
o Technical details

Substation Layouts Indoor & Outdoor

o Site Conditions.
o Equipment dimensioning.
o Equipment Layout drawings Indoor substations
o Civil assignment drawings (Cut out/Insert plate)
o Design Criteria- (Trench/Tunnel/overhead)
o Transformer Civil assignment drawings.
o Busduct layouts
o Typical Equipment layout drawings for Outdoor (Design criteria Dimensioning, clearances etc).

Cable selection and size calculation

o HV Cable selection Criteria Up to 400kV
o MV Cable selection Criteria Up to 33kV
o LV Cable selection Criteria 1.1kV
o Control & Instrument Cables Selection
o About Derating factors.
o MV/LV cable sizing
o Cable specifications

Batteries and Battery Chargers

o Introduction
o Battery Type and Selections.
o Battery Sizing
o Characteristics of batteries
o Battery sizing calculations

Earthing calculations

o Introduction
o Earthing Concepts, Types of Earthing & Soil Resistivity.
o Earthing Selection criteria, Calculations, typical Sizing and Layouts.
o Primary & Secondary Earthing.
o Outdoor Earthing (step & Touch Potential)
o Earthing Layouts Drawings
o Lightning Protection Concepts & Design Criteria

Lightning Protection

o Introduction/Standards
o Basic selection Criteria, Material selection etc
o Design Calculation

Diesel Generators

o Introduction
o Overview of the different types of diesel generators
o Ratings and specifications of diesel generators, power output, fuel consumption, and voltage.
o Efficiency, emission levels, and noise levels.

Lighting Fixtures

o Introduction

o Important terminologies

o Lighting fixtures calculation

Part 04 - Substation Automation

o Basics about SAS

o Configuration

o Layers in SAS

o The interface of primary equipment and SAS.

o IO list

Part 05 - GIS MV and HV

o Basics fundamental about GIS

o Main components of GIS

o Technical data sheet

o GIS operation

Part 06 - Busbars

o Introduction to Bus-Bar Schemes

o Detail Study of the One and Half Breaker Scheme; Double Main & Transfer Bus Scheme etc.

o Introduction to Key SLD

o Development of Detailed SLD

Part 07 - PLCC & telecontrol

o Introduction

o Coupling Capacitor

o LPU

o Power Line Carrier (Applications)

o Fibre Optic Data Transmission

Part 08 - EHV-AC Substation

o Introduction

o Outdoor yards busbars

o Corona rings and corona bells

o Mechanical stresses on Insulators

o Safety factors for support insulators

o Accessories for EHV Consuctors

o Bundle Conductors

o Insulation Levels

o Clearances

o Configuration of EHV-Ac Transmission Line

o Electrical field at working level

o Relay coordination, etc.....

Part 09 - MEP services in Plants

o Ventilation

o FAS and FireFighting

o Drainage

Part 10 - Power System study (ETAP - Recorded)

Overview & basics of Etap

o Input data for Etap study

o Load flow analysis

o short circuit analysis

o Relay coordination

Part 11 - AutoCAD

AutoCAD (Recorded)

o Introduction
o Drawing commands
o Modifying commands
o Editing commands
o Dimension commands
o Block and layer commands
o Print commands
o Helping commands

Part 12 - Real-Time Project Discussion

Tools

o All Classes are Live via Google Meet or Zoom
o MS PowerPoint slides
o Transformers, CT/PT sizing Cables, Battery sizing, etc Calculation on Excel based.
o Single Line diagram and Basic Layouts by AutoCAD
o Power system study (LF/SC/RC) by ETAP tool

Benefits of the program

1. *Job-ready programs*
2. *Updated course content*
3. *ISO-certified completion certificate*
4. *PDF notes provided*
5. *100% refund guarantee*

Features of the program

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

Contact:

Electrical Learning Portal | ELP

☎ +91-8430180594

✉ smart.solutionsengrltd@gmail.com

🌐 https://electricallearningportal.com