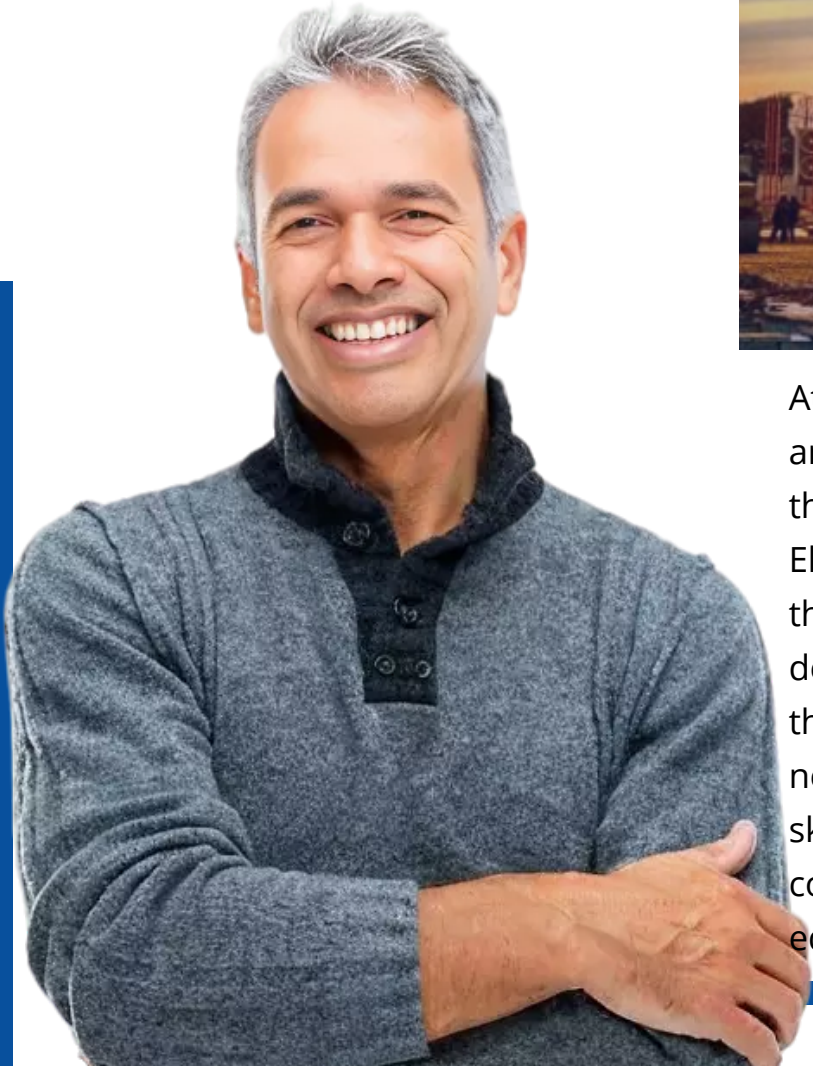




ENGINEERS' CERTIFICATION PROGRAM

Engineering Skills



ELECTRICAL LEARNING PORTAL ELP



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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ELECTRICAL DISTRIBUTION SYSTEM DESIGN | LIVE

The "Electrical Distribution System Design" course provides a comprehensive exploration of electrical design principles, spanning from foundational concepts to advanced applications. The course equips participants with the skills needed to design efficient and compliant power distribution systems. Through a blend of theory and hands-on exercises, participants gain practical insights into interior design considerations, motor selection, and system protection. The course ensures a holistic understanding of electrical design, empowering participants to contribute effectively to the development and implementation of robust electrical distribution systems.

Design is not just calculations of some equipment, designing depends on many factors:

- Environmental factor
- Expectations of the client
- Future Expansion Plan
- Occupants Lifestyle
- Type of the project (residential, commercial, institutional, or public buildings)

By considering the above-mentioned factors, the selection of the correct and appropriate size and type of equipment or device is the name of Designing.

And the consideration factors are defined by different engineering societies such as NEC, IEC, IEEE, NEMA, ANSI, etc., national and local authorities such as DEWA, BIS, BS, ISI, municipal corporations, etc.

Type of project discussed in the course:

- 1. Residential Buildings:** High-rise residential buildings, Low-rise, Bungalows, etc.
- 2. Commercial Buildings:** Shopping centers, Malls, Transport terminals (Airports, Metro Stations, railway stations, Bus terminals, Taxi terminals), Restaurants, Hotels, etc.
- 3. Institutional and Public Buildings:** Schools, Colleges, Hospitals, Religious buildings, Sports Arena, Government buildings, etc.



TOPICS

1. Introduction

- *Understanding the course title*
- *Power system*
- *Fundamental Objectives of Designing (IEEE)*
- *Fundamental factors*
- *Project Planning*

2. Basics of Electrical Designing

- *Types of loads and their nature*
- *Different powers exist in the system and their practical use*
- *Selection of single phase & three phase*
- *Understanding the load current or feeder current*
- *Calculation of power*
- *Single Line Diagram/One Line Diagram*

3. Codes & Standards

- *NEC & NFPA*
- *IEEE*
- *IEC*
- *NEMA*
- *ANSI*

4. Voltage Consideration

- *Introduction*
- *Why it is important to consider the correct voltage level?*
- *Relation of voltage level with performance, reliability, and efficiency of the system*
- *Important terms*
- *System voltage classes*
- *Standard voltages and frequency*

- *Voltage Tolerance*
- *Frequency of power system*
- *Voltage regulation*
- *Supply voltage levels*
- *Voltage ratings of utilization equipment*
- *Impact of overvoltage and undervoltage*

5. Lighting design

- *Types of lighting scheme*
- *Types of lighting lamps (Interior)*
- *Important terms*
- *Lighting fixture*
- *Protection level (IP rating)*
- *Lighting fixtures calculation*

6. Reactive Power Compensation

- *Introduction*
- *Types of capacitors (based on shape)*
- *Classification of power capacitors*
- *Selection criteria of power capacitor*
- *Selection of compensation mode*
- *Type of Compensation*
- *Calculation (smart approach)*

7. Interior Designing

- *Total Connected Load (TCL)*
- *Demand factor and Demand Load*
- *Circuit designing*
- *Load Balancing*
- *DB Size*

8. Electric Motors

- *Introduction*
- *Motor name plate understanding*
- *Locked Rotor/Starting Current calculation of motor*
- *Circuit designing – Circuit element selection*

9. Protection of the system

- *Introduction*
- *LV protection system & its requirements*
- *Causes of faults*
- *Short Circuit, Overload & earth leakage*
- *Types of Circuit breakers used in LV system*
- *MCB, MCCB, ACB & RCB/RCCB – Working principle, classifications, ratings*
- *Selection of circuit breaker as per the applications*

10. Selection of Electrical Equipment

• **Transformer**

- *Introduction*
- *Operating Principle*
- *Types of transformers*
- *Cooling methods*
- *Tap changing transformer*
- *Parallel operation conditions*
- *Selection Criteria*
- *Size Calculation*

• **Diesel Gen**

- *Introduction*
- *Types of DG sets (based on ratings)*
- *Load acceptance concept*
- *Control systems*
- *Factors affecting DG output ratings*
- *Size calculation*

• **UPS - Uninterrupted Power Supply**

- *Introduction*
- *Why is power protection important?*
- *Types of UPS*
- *Forms of UPS*
- *Types of UPS deployment*
- *Selection of UPS – 3-Phase & 1-Phase*
- *Different UPS configurations*
- *UPS size calculation*

• **Busbar**

- *Introduction*
- *Application of busbars*
- *Size calculation*

• **Lightning Protection System (LPS)**

- *Necessity of LPS*
- *Sources of damage*
- *Types of possible losses*
- *Selection criteria*

11. Power Cable

- Introduction
- Types of power cables
- Parts of cables
- Classification of Insulation
- Selection of power cables
- Size calculation of power cables
- Voltage Drop Calculation
- Short Circuit Current (SCC)
- Circuit Breaker Tripping time

12. Earthing

- Introduction
- Types of earthing
- Selection of earthing system elements

13. Harmonics

- Introduction
- Linear & nonlinear load
- Understanding the harmonics concept
- PCC concept
- Origin of harmonics
- Harmonics indicators
- Effects of harmonics
- Maximum permissible harmonic levels in the system
- Mitigation techniques of harmonics

14. Software

- DIALux
- AutoCAD | On-Demand Videos

15. Electrical Drafting (On-demand videos)

To make learning easy and interesting, the completed drafting part is divided into three sections:

1. Basics of Electrical Drafting
2. AutoCAD Software
3. Electrical Services Drafting

Tools

- o All Classes are Live via Google Meet or Zoom
- o MS PowerPoint slides
- o Single Line diagram and Basic Layouts by AutoCAD
- o Lighting Design by DIALux

Benefits of the program

1. Join the professional training
2. Understand the real world
3. Be a part of the Professional Engineers' Community
4. **Program Completion Certificates**
5. **Join our engineers' WhatsApp Groups**

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