Introduction:

The **Electrical Power Systems for Non-Engineers Training Course** provides a thorough introduction to electrical power systems, tailored specifically for individuals without an engineering background. The course begins with traditional electricity generation methods and progresses to renewable energy systems, offering a foundational understanding of electrical power systems.

Key topics include power generation, transmission, and distribution, with a focus on essential components like transformers, circuit breakers, electric motors, and earthing systems. Participants will also learn about electrical safety, risk mitigation, and the interpretation of single-line diagrams for analyzing electrical installations.

A robust emphasis on maintenance practices, supported by standard testing and measuring instruments, ensures participants are equipped to manage the reliability and safety of electrical systems.

Enhancing Electrical Power Systems Expertise

This course is an excellent opportunity for non-engineers to gain foundational knowledge and improve their proficiency in electrical power systems. Participants seeking advanced expertise in areas like electrical power system protection and safety protocols are encouraged to explore specialized training programs.

Targeted Groups

This course is ideal for:

- **Mechanical Engineers** and Technicians.
- **Safety Officers** managing electrical safety.
- **Civil Engineering Personnel** involved in projects with electrical systems.
- **Administrative and Management Staff** overseeing electrical installations.

Course Objectives

By completing this training, participants will:

1. Understand the fundamentals of electricity generation, transmission, and distribution.
2. Gain insights into grounding systems and their safety implications.
3. Assess risks related to electric shocks and arc flash hazards.
4. Comprehend electrical faults and the role of protective devices.
5. Become familiar with key electrical components, including transformers,

motors, and circuit breakers.

Targeted Competencies

Participants will develop competencies in:

- Grasping the basics of electricity generation, transmission, and distribution.
- Understanding single-phase and three-phase AC systems.
- Calculating power and power factor in AC networks.
- Recognizing and applying protection devices in electrical installations.
- Practicing electrical safety and understanding shock hazards.

Course Content

Unit 1: The AC Network and Electric Shock Hazards

- Fundamentals of electricity generation, transmission, and distribution for single-phase and three-phase systems.
- Overview of AC network configurations: star and delta connections.
- Key electrical concepts: voltage, current, impedance, and power factor.
- Importance and types of earthing systems in electrical networks.
- Electrical safety practices and the risks of electric shocks.

Unit 2: Operation of Various Electrical Protection Devices

- Overview of fuses for low-, medium-, and high-voltage applications.
- Principles and operation of Miniature Circuit Breakers (MCB).
- Construction and functionality of Molded Case Circuit Breakers (MCCB).
- Mechanics of air circuit breakers, vacuum circuit breakers, and SF6 circuit breakers.

Unit 3: Distribution Power Transformers and AC Motors

- Types, construction, and components of transformers.
- Transformer cooling systems and their importance.
- Single-phase and three-phase AC motor principles.
- Starting methods for AC motors.

Unit 4: Interpretation and Use of Electrical Drawings

- The role and significance of electrical drawings in the industry.
- Understanding symbols and tracing components in single-line diagrams.
- Techniques for interpreting and designing single-line diagrams effectively.

Unit 5: Common Test Equipment and Maintenance

- Familiarity with tools like digital multimeters and insulation

resistance testers.
- Importance of proper maintenance and various maintenance strategies.
- Types of maintenance practices for electrical installations.

Unit 6: Introduction to Single Line Diagrams (SLD)

- Definition, purpose, and significance of Single Line Diagrams.
- Identification of common symbols used in SLDs.
- Techniques for interpreting and designing basic Single Line Diagrams.

Conclusion

This **Electrical Power Systems for Non-Engineers Training Course** is a comprehensive program for non-engineers aiming to build a foundational understanding of electrical power systems. By covering key concepts, safety practices, and maintenance strategies, this course equips participants to contribute effectively to projects involving electrical systems.