



Electrical Engineering for Non-Electrical Engineers

Duration 5 Days

Introduction:

Electricity has become a part and parcel of the modern society and we cannot think of leading a normal life in this world without electricity. Therefore, the knowledge of electrical engineering has become essential to successfully utilize the electrical energy and operate the electrical equipment not only for the electrical engineers but also for non-electrical engineers.

In this course certain important aspects of electrical engineering required for non-electrical engineers and the operating principles of some commonly used electrical devices will be dealt with. Basic principles of protection of electrical components and human operators and safety procedures which are essential for non-electrical engineers are clearly explained.

Course Objectives

- Understand the fundamental principles of electrical engineering
- Know the operating principles of commonly used electrical devices
- Learn some important basic laws of electrical engineering
- Appreciate the difference between single-phase and three-phase systems
- Understand the operations of a few electrical machines such as transformers, induction motors, dc machines, and synchronous machines
- Know the safety procedures to be adopted in electrical installations
- Design simple lighting systems
- Know the importance of harmonics and its effects
- Learn the power factor improvement methods in reducing the electricity bill

Who Should Attend

All non electrical engineer : Civil, mechanical, chemical, IT Sales Engineers / Executive Junior Electrical Engineers

Course Outlines:

01) Introduction

- General introduction to electrical engineering
- Historical development
- Commonly used units

02) Fundamentals of Electricity and Magnetism

- Conventional and electron current flow
- DC voltage and Current
- AC (Sinusoidal) voltage and current
- Power and energy
- Resistance, inductance and capacitance
- Conductor in magnetic field
- Power in single-phase AC circuits



03) Simple Electric Circuits

- Ohm's law
- Kirchhoff's laws
- Power, apparent power, reactive power and power factor
- Simple electric circuits

04) Three-Phase Circuits

- Polyphase systems
- Balanced three-phase system
- Power in a three-phase system

05) Power Factor Correction and Harmonics

- Maximum demand and electrical utility bill
- Power factor correction
- Harmonics in voltage and current
- Acceptance level of harmonics
- Effects of harmonic current and voltage on electrical machines
- Harmonic filters

06) Electrical Machines

- Transformers
- DC machines
- Induction machines
- Synchronous machines
- Special machines

07) Electric Power System

- Conventional and renewable energy sources
- Conventional power plants
- A typical power system
- Transmission and distribution
- Industrial and house wirings

08) Fault calculation and protections systems

- Symmetrical fault analysis
- Simple protection systems

09) Electrical safety

- Electrical shock
- Earthing systems
- Safety procedures



10) Electrical Installation Design

- Design procedure
- Design current
- Nominal setting of protection
- Correction factor
- Current-carrying capacity
- Choice of cable size
- Thermal constrains.

11) Lighting

- Luminous intensity and flux
- Types of light sources
- Calculation of lighting requirements
- Glare and Stroboscopic effect.

11) Primary and secondary cells (Batteries)