Fundamentals Of Electrical Systems Course

Venue Information

Venue: London UK

Place:

Start Date: 2026-07-28

End Date: 2026-08-01

Course Details

Net Fee: £4750.00

Duration: 1 Week

Category ID: EAPET

Course Code: EAPET-26

Syllabus

Course Description

This 5 days course covers the electrical principles and components used in Electrical systems and industrial instrumentation, emphasizing safety. You'll cover schematic symbols and the use of basic test equipment.

Course Objectives

At the end of this course the participant will be able to:

- Evaluate the direct current (DC) relationships between voltage, current, and resistance
- Determine alternating current (AC) characteristics including amplitude, frequency, and phase
- Identify the properties of an inductor and of a capacitor
- Using basic test equipment to evaluate and to determine basic electrical characteristics
- Apply safety considerations when measuring electrical values or working around electrical equipment
- Compare bridge operation in balanced and unbalanced condition

Course Outline

Electrical Properties

- Basic Electricity
- The Atom
- Electrons of Different Materials
- Electrical Terms
- Electrical Potential Moves Electrons
- Why Electrons Move
- Voltage Defined
- Current Defined
- Resistance Defined
- Electrical Circuit
- Sources of Electricity

Magnetism

- Magnetic Field
- Introduction to Generating a Voltage
- Generating DC Electricity
- Controlling Voltage Generated
- Generating DC vs. AC power
- The Sine Wave
- Frequency
- Peak – Peak to Peak -- RMS Voltages
- Multi Phase Power Generation
- Three Phase Power Voltage Advantage
- Why it is Hard to Push Electrons?
- Power Distribution

Law's of Electricity

- Ohm's Law
- Variations of Ohm's Law
- Simple Ohm's Law Operations
- Sample Problems
- Kirchoff's Law for Voltage

- Electro Magnetic Fields
- Electrical Work Terms
- Large and Small Numbers
- Electrical Measurements

Safety, Safety, Safety!

- Caution Note
- Measuring Voltage Precautions
- Current Measuring Precautions
- Resistance Measuring Precautions
- A Complete Path
- Measurement - Voltage
- Measurement - Current
- Measurement - Resistance

Series & Parallel Resistances

- Series or Parallel???
- Series Resistances
- Series Circuit
- Parallel Resistances
- Computing Parallel Resistance
- Combination Circuit (DC Bridge)
- Typical Bridge Circuit Depiction

Electrical Schematic Symbols

- Resistors Pictorial
- Resistor Schematic Symbols
- Signal Schematic Depiction
- Switches
- Push Button Switch
- Symbology of Connection
- Overload Symbology
- Limit & Other Switches
- An Electrical Circuit

Capacitance

- Capacitors in Parallel
- Capacitors in Series
- RC Time Constant
- Discharge Path
- Optional RC Assignment
- Capacitors & AC
- Capacitors & Switched DC
- Capacitive Reactance

Inductance

- Magnetic Field
- Ferrous Core
- Solenoids
- LR Time Constant
- Inductive Kick
- Inductors & Switched DC
- Inductive Reactance

Impedance and Resonance

- Impedance Defined
- Impedance Determined by Vector
- Resonance - Defined
- Series Resonant Circuit
- Parallel Resonant Circuit
- Resonance Formula

Transformers

- Increasing Voltage for Distribution
- Step-Down vs. Step-Up
- Turns Ratio
- Power Distribution Power In/Power out
- Transformer Load Currents
- Transformer Efficiency
- Transformer Applications
- User End of Distribution

- The Relay
- A Solenoid
- AC and DC Solenoids
- Contactors
- Uses of Contactors (Sealing Circuits)

Industrial Power

- Definition of “Ground….”
- Solidly Grounded System
- Grounding Elements
- Single Rod
- Grid
- Radials
- Ground Maintenance
- Three-Phase Power
- WYE Transformers (Star)
- Delta Transformers
- Common Industrial Voltages
- Voltage Applications
- Typical Industrial Distribution System

Overcurrent Protection

- Overcurrent Contributors
- GF Protection Devices
- Fuses
- Plug Type Fuses
- Cartridge Fuses
- Cartridge Fuse Lengths
- Fuses - Rejection Feature
- Circuit Breakers

Industrial Wiring

- Equipment Grounding
- Power Wiring

- Conductor Selection
- Documentation

Industrial Electrical Safety

- Hazardous Locations