



EE201

Fundamentals of Electrical Systems



International Association
for Health and Occupational Safety
and the Environment



Course Introduction:

This course presents an overview of the physical electrical system. Delegates who are new to the industry, or even a veteran who was never fully exposed to the physical aspects of the electrical business, Electric System Fundamentals is designed to help you better understand these basic principles.

You will learn the units by which electricity is measured, the difference between AC and DC power, the basic laws of electricity, and the jargon which pervades the industry. This course is designed to provide a thorough understanding of the electrical system about generation, transmission, distribution, services, and the customer meter.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Understand the Electric industry jargon and basic electrical principles
- Understand generation types and sources and their advantages and disadvantages
- Learn how the physical system is structured and operated to delivery electricity
- Understand the purpose, function and components of the transmission system
- Recognized the purpose, function and components of the distribution system
- Discuss how service connections are provided to customer facilities
- Understand how electricity is delivered into and metered at the consumer's facility
- Explain how the physical system impacts costs and services to customers

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International Centre For Training & Development

Who Should Attend?

This course is intended for Electrical Engineers, Technicians and Technologists, Electrical Project Managers and other technical staff dealing with electrical.

Course Outline:

Day 1:

Electrical Definitions

- Electricity, volts, amps, watts, kilowatts, kilowatt-hours, kilovolt-amperes
- Conductors and insulators
- Voltage (volts), resistance (amps)
- Direct current (DC) and alternating current (AC)
- Basic electrical relationships (Ohms Law, Watts Law)

- Circuits (functions and types)
- Real power, apparent power, reactive power
- Power factor
- Calculation examples

Rate Structures

- How electric rates relate to the physical system
- How electric rates vary
- Electric bill components
- Demand ratchets

Day 2:

Generating Electricity

- The electrical system
- Types and sources of generation
- Advantages/disadvantages/costs of each generation type
- Single vs. three phase
- Station transformers and switchyards
- Functions of power control
- Load forecasting
- How units are dispatched

The Transmission System

- Purpose and function
- Components (substations, transformers, switchyard, transmission lines)
- Interconnections
- North American electrical grids
- Power flow and control

Day 3:

The Distribution System

- Purpose and function
- Components (substations, distribution lines, lighting arrestors, voltage regulators, fuses, reclosers, capacitor banks)
- Distribution circuits (types and voltages)
- Lines (wye vs. delta; overhead vs. underground)
- Primary vs. secondary distribution

Day 4:

The Secondary System and Electrical Services

- Services (overhead and underground; single phase and three phase, voltage)
- Components (service transformer, service drop, meter loop, meter, main disconnect, service/breaker panel, branch circuits)

Day 5:

Meters and Metering

- Types of meters
- Current transformers (CTs) and potential transformers (PTs)
- Location of meters
- Registers
- Smart meters and automatic meter reading (AMR)

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

