

Module 1: Electrical Safety – 8 hours

Electrical Safety

This module introduces the trainees to the safety rules and regulations for electricians, including the necessary precautions for avoiding various job site hazards.

- Introduction
- Electrical Shock
- Reducing Your Risk
- OSHA
- NFPA 70E
- Ladders and Scaffolds
- Lifts Hoists, and Cranes
- Lifting
- Basic Tool Safety
- Confined Space Entry Procedures
- First Aid
- Solvents and Toxic Vapors
- Asbestos
- Batteries
- PCBs and Vapor Lamps
- Lead Safety
- Fall Protection Procedures

Module 2: Motor Controls - 40 hours

DC Circuits

This module introduces the trainee to DC electrical circuits. It offers a general introduction to electrical concepts used in Ohm's law. It includes atomic theory, electromagnetic force, resistance, and electric power equations, and describes series, parallel, and series-parallel circuits.

- Introduction
- Atomic Theory
- Electrical Power Generation and Distribution
- Electric Charge and Current
- Ohm's Law
- Schematic Representation of Circuit Elements
- Resistors
- Electrical Power
- DC Circuits
- Solving Resistance Problems
- Applying Ohm's Law
- Kirchhoff's Laws

AC Circuits

This module provides an introduction to AC theory, circuits, and components including inductors, capacitors, and transformers. It covers the calculation of reactance and impedance in RL, RC, LC, and RLC circuits using math and vector analysis.

- Introduction
- Sine Wave Generation
- Sine Wave Terminology
- AC Phase Relationships
- Nonsinusoidal Waveforms
- Resistance in AC Circuits
- Capacitance
- RL, RC, LC and RLC Circuits
- Power in AC Circuits
- Transformers

Motors: Theory & Application

This module introduces the operation and applications of various types of motors. It also explains how motors are rated and covers motor enclosures and braking requirements.

- Introduction
- DC Motor Principles
- Types and DC Motors
- Alternating Current Motors
- Multiple Speed Induction Motors
- Variable Speed Drives
- Motor Enclosures
- NEMA Frame Designations
- Motor Ratings and Nameplate Data
- Connections and Terminal Markings for AC Motors
- NEC Requirements
- Braking
- Motor Installation

Motor Controls

This module introduces the methods and procedures used in selecting and wiring motor controls.

- Introduction
- Electromechanical Relays
- Magnetic Contactors
- Overload Protection
- Magnetic and Manual Motor Starters
- Control Transformers and Pilot Devices
- Drum Switches
- Enclosures
- Diagrams
- NEC Regulations for the Installation of Motor Control Circuits
- Connecting Motor Controllers for Specific Applications