



## **CURRICULUM FOR ELECTRICAL LEVEL - 1**

### **For ABC, Inc. - Northern Ohio Chapter, Training Program**

#### **OSHA 10hr. Training**

**Core** – 72.5 Mandatory Hours; 15 Elective/Optional Hours: Covers basic safety, construction math, hand and power tools, blueprint reading, basic rigging, and communication & employability skills.

**Orientation to the Electrical Trade** – 2.5hrs: Overview of the Electrical Trade.

**Electrical Safety** – 10hrs: Covers safety rules and regulations for electricians and teaches necessary precautions to take for various electrical hazards found on the job.

**Introduction to Electrical Circuits** – 7.5hrs: Offers a general introduction to the electrical concepts used in Ohm's law.

**Electrical Theory** – 7.5hrs: Introduces series, parallel, and series-parallel circuits and covers resistive circuits, Kirchoff's voltage and current laws and circuit analysis.

**Introduction to the National Electrical Code (NEC)** – 7.5hrs: Provides a navigational road map for using the latest edition of the NEC book.

**Device Boxes** – 10hrs: Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components.

**Hand Bending** – 10hrs: Conduit bending and installation and covers techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

**Raceways, Boxes, and Fittings** – 20hrs: Introduces the types and applications of raceways, wireways, and ducts, along with stressing the appropriate NEC requirements.

**Conductors and Cables** – 10hrs: Focuses on types and applications of conductors and covers proper wiring techniques.

**Basic Electrical Construction Drawings** – 7.5hrs: Focuses on electrical prints, drawings, and symbols and teaches types of information that can be found on schematics, one-lines, and wiring diagrams.

**Residential Electrical Services** – 15 Hrs.: Covers the electrical devices and wiring techniques common to residential construction and maintenance and allows trainees to practice making service calculations

**Electrical Test Equipment** – 5hrs: Focuses on proper selection, inspection, use & maintenance of common electrical test equipment and allows trainees to practice using many of the instruments while learning the appropriate test procedures and safety rules.

**Total Hours Level One: 185**



## **CURRICULUM FOR ELECTRICAL LEVEL - 2**

### **For ABC, Inc. - Northern Ohio Chapter, Training Program**

**Alternating Current** – 17.5hrs: Focuses on forces that are characteristic of alternating-current systems and the application of Ohm’s law to AC circuits.

**Motors: Theory and Application** – 20hrs: Covers AC and DC motor, including the main parts, circuits, and connections.

**Electric Lighting** – 15hrs: Introduces the basic principles of human vision and the characteristics of light as well as focuses on the handling and installation of the different kinds of lamps and lighting fixtures.

**Conduit Bending** – 15hrs: Covers all types of bends in all sizes of conduit up to 6” and focuses on mechanical, hydraulic, and electrical benders.

**Pull and Junction Boxes**– 12.5hrs: Driven by NEC, this explains how to select and size pull boxes, junction boxes and handholes.

**Conductor Installations** – 10hrs: Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.

**Cable Tray** – 7.5hrs: Focuses on NEC installation requirements for cable tray, including modifications and cable installations.

**Conductor Terminations and Splices** – 7.5hrs: Methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

**Grounding and Bonding**– 15hrs: Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC regulations.

**Circuit Breakers and Fuses** – 12.5hrs: Describes fuses and circuit breakers along with their practical applications. Covers short-circuit calculation.

**Control Systems and Fundamental Concepts** – 12.5hrs: Gives basic descriptions of various types of contactors and relays along with their practical applications.

**Total Hours Level 2:                      145**



## **CURRICULUM FOR ELECTRICAL LEVEL - 3**

### **For ABC, Inc. - Northern Ohio Chapter, Training Program**

**Load Calculations – Branch Feeders and Circuits** – 17.5hrs: Explains how to calculate branch circuit feeder loads for various residential and commercial applications.

**Conductor Selection and Calculations** – 15hrs: Types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

**Practical Applications of Lighting** – 12.5hrs: Covers specific types of incandescent, fluorescent, and HID lamps, as well as ballasts, troubleshooting, and various types of lighting controls.

**Hazardous Locations** – 15hrs: Cover the NEC requirements for equipment installed in various hazardous locations.

**Overcurrent Protection** – 25hrs: Explains how to size and select circuit breakers and fuses for various applications.

**Distribution Equipment** – 12.5hrs: Explains distribution equipment, including grounding, switchboard and ground fault maintenance, transformers, and electrical drawing identification.

**Transformers** – 12.5hrs: Discusses transformer types, construction, connections, protection, and grounding along w/capacitors & rectifiers.

**Commercial Electrical Services** – 10hrs: Covers the components, installation considerations, and NEC requirements for various commercial services.

**Motor Calculations** – 12.5hrs: Cover single and multi-motor calculations to size conductors, overcurrent protection, and overload protection for motor applications.

**Voice, Data, and Video** – 10hrs: Covers installation, termination, and testing of various voice, data, and video.

**Motor Controls** – 12.5hrs: Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

**Total Hours Level 3:                      155**



## **CURRICULUM FOR ELECTRICAL LEVEL - 4**

### **For ABC, Inc. - Northern Ohio Chapter, Training Program**

**Load Calculations – Feeders and Services** – 20hrs: Basic calculation procedures and calculations for commercial and residential applications.

**Health Care Facilities** – 10hrs: Covers the installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.

**Standby and Emergency Systems** – 10hrs: Explains NEC installation requirements for electric generators and storage.

**Basic Electronic Theory** – 10hrs: Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

**Fire Alarm Systems** – 15hrs: Covers fire alarm control units, Digital Alarm Communicator Systems (DACs), installation wiring for alarm initiating and notification devices, and alarm system maintenance.

**Specialty Transformers** – 10hrs: Covers various types of transformers and their applications, and provides information on selecting, sizing, and installing these devices.

**Advanced Motor Controls** – 20hrs: Explains applications and operation principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.

**HVAC Controls** – 15hrs: Provides a basic overview of HVAC systems and their controls. Also covers basic electrical troubleshooting and NEC requirements.

**Heat Tracing and Freeze Protection** – 10hrs: Covers various heat tracing systems along with their applications and installation requirements.

**Motor Operation and Maintenance** – 10hrs: Covers motor cleaning, testing, and preventative maintenance, and describe basic troubleshooting procedures.

**Medium Voltage Terminations/Splices** – 10hrs: Offers an overview of the NEC and cable manufacturers' requirements for high voltage terminations and splices.

**Special Locations** - 20hrs: Describes the NEC requirements for selecting and installing equipment, enclosures, and devices in various special locations.

**Fundamentals of Crew Leader** – 20hrs: Along with the principles of project planning, scheduling, estimating, and management, teaches the basic skills required for supervising personnel.

**Total Hours Level 4:**

**180**