

Electrical Apprenticeship Program Curriculum

Electrical Level One

26101-02 Electrical Safety (12.5 Hours)

Covers safety rules and regulations for electricians. Trainees learn the necessary precautions to take for various electrical hazards found on the job. Also teaches the OSHA-mandated lockout/tag out procedure.

26102-02 Hand Bending (7.5 Hours)

Provides an introduction to conduit bending and installation. Covers the techniques for using hand-operated and step conduit benders, as well as cutting, reaming, and threading conduit.

26103-02 Fasteners and Anchors (5 Hours)

Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Trainees learn the various types of anchors and supports, their applications, and safe installation.

26104-02 Electrical Theory One (7.5 Hours)

Offers a general introduction to the electrical concepts used in Ohm's law applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations.

26105-02 Electrical Theory Two (7.5 Hours)

Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

26106-02 Electrical Test Equipment (7.5 Hours)

Focuses on proper selection, inspection, use, and maintenance of common electrical test equipment. Trainees get to practice using many of the instruments while learning the appropriate test procedures and safety rules.

26107-02 Introduction to the National Electrical Code® (2.5 Hours)

Provides a navigational road map for using the NEC®. Trainees are introduced to the layout of the NEC® and the types of information found within the code book. Trainees are able to practice finding information using an easy-to-follow procedure.

26108-02 Raceways, Boxes, and Fittings (12.5 Hours)

Introduces the types and applications of raceways, wireways, and ducts. The appropriate NEC® requirements are stressed.

26109-02 Conductors (15 Hours)

Focuses on the types and applications of conductors and covers proper wiring techniques. The appropriate NEC® requirements are stressed.

26110-02 Introduction to Electrical Blueprints (7.5 Hours)

Focuses on electrical prints, drawings, and symbols. Trainees learn the types of information they can find on schematics, one-lines, and wiring diagrams.

26111-02 Wiring: Commercial and Industrial (7.5 Hours)

Covers the electrical devices and wiring techniques common to commercial and industrial construction and maintenance. The appropriate NEC® requirements are stressed.

26112-02 Wiring: Residential (15 Hours)

Covers the electrical devices and wiring techniques common to residential construction and maintenance. Trainees also practice making service calculations. Stresses appropriate NEC® requirements.

Electrical Level Two

26201-03 Alternating Current (15 Hours)

Focuses on forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits.

26202-03 Motors: Theory and Application (20 Hours)

Covers AC and DC motors including the main parts, circuits, and connections.

26203-03 Grounding (12.5 Hours)

Focuses on the purpose of grounding and bonding electrical systems. NEC® regulations are thoroughly covered.

26204-03 Conduit Bending (15 Hours)

Covers all types of bends in all sizes of conduit up to 6 inches. Focus is placed on mechanical, hydraulic, and electrical benders.

26205-03 Boxes and Fittings (10 Hours)

An NEC®-driven module that explains how to select and size outlet boxes, pull boxes, and junction boxes.

26206-03 Conductor Installations (10 Hours)

Covers the transportation, storage, and setup of cable reels; methods of rigging; and procedures for complete cable pulls in raceways and cable trays.

26207-03 Cable Tray (15 Hours)

Focuses on NEMA and NEC® installation requirements for cable tray, including modifications and cable installations.

26208-03 Conductor Terminations and Splices (7.5 Hours)

Describes methods of terminating and splicing conductors of all types and sizes, including the preparation and taping of conductors.

26209-03 Installation of Electric Services (15 Hours)

Covers methods and techniques for both single and three-phase services, including metering equipment and NEC® regulations.

26210-03 Circuit Breakers and Fuses (12.5 Hours)

Describes fuses and circuit breakers along with their practical applications. Short-circuit calculation is also covered.

26211-03 Contactors and Relays (10 Hours)

Gives basic descriptions of various types of contactors and relays, along with their practical applications.

26212-03 Electric Lighting (10 Hours)

Introduces the basic principles of human vision and the characteristics of light. Focuses on the handling and installation of the different kinds of lamps (incandescent, fluorescent, and HID) and lighting fixtures (surface-mounted, recessed, suspended, and track lighting).

Electrical Level Three

26301-02 Load Calculations – Branch Circuits (12.5 Hours)

Introduces the industry standards for electrical work, including the topics of branch circuits, rating and derating, and various types of residential and commercial electrical loads.

26302-02 Conductor Selection and Calculations (15 Hours)

Covers the types of conductors used in wiring systems, including insulation, current-carrying capacity, and temperature ratings.

26303-02 Overcurrent Protection (12.5 Hours)

Stresses the use of a variety of overcurrent protection devices, including circuit breakers and fuses, in all types of electrical systems.

26304-02 Raceway, Box and Fitting Fill Requirements (12.5 Hours)

Covers the number of conductors allowed in raceways, boxes, and fittings.

26305-02 Wiring Devices (10 Hours)

Covers popular receptacles and switches, and takes an in-depth look at safety switches and other wiring devices.

26306-02 Distribution Equipment (12.5 Hours)

Explains distribution equipment, including grounding, switchboard and ground fault maintenance, transformers, and electrical drawing identification.

26307-02 Distribution System Transformers (15 Hours)

Discusses transformer types, construction, connections, protection, and grounding along with capacitors and rectifiers.

26308-02 Lamps, Ballasts, and Components (5 Hours)

Covers specific types of incandescent, fluorescent, and HID lamps, as well as ballasts, troubleshooting, and various types of lighting controls.

26309-02 Motor Calculations (12.5 Hours)

Covers single and multi-motor calculations to enable the trainee to size conductors, overcurrent protection, and overload protection for motor applications.

26310-02 Motor Maintenance, Part One (12.5 Hours)

Covers proper maintenance of motors in use and in storage. Includes a troubleshooting and motor identification guide.

26311-02 Motor Controls (20 Hours)

Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

26312-02 Hazardous Locations (15 Hours)

All classes of hazardous locations are covered, including seals, components, and equipment approved for use in various hazardous locations.

Electrical Level Four

26401-03 Load Calculations –Feeders and Services (15 Hours)

Topics include basic calculation procedures and calculations for commercial and residential applications.

26402-03 Practical Applications of Lighting (10 Hours)

Covers various lighting installations, applications, and wiring systems.

26403-03 Standby and Emergency Systems (12.5 Hours)

NEC® installation requirements for electric generators and storage batteries are fully explained.

26404-03 Basic Electronic Theory (20 Hours)

Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

26405-03 Fire Alarm Systems (15 Hours)

Covers fire alarm control units, Digital Alarm Communicator Systems (DACS), installation wiring for alarm initiating and notification devices, and alarm system maintenance.

26406-03 Specialty Transformers (15 Hours)

Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.

26407-03 Advanced Motor Controls (20 Hours)

Explains applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.

26408-03 HVAC Controls (15 Hours)

Provides a basic overview of HVAC systems and their controls. Stresses electrical troubleshooting and NEC® requirements.

26409-03 Heat Tracing and Freeze Protection (10 Hours)

Covers various heat tracing systems along with their applications and installation requirements.

26410-03 Motor Maintenance, Part Two (12.5 Hours)

Covers motor cleaning, testing, and preventative maintenance. Also describes basic troubleshooting procedures.

26411-03 High-Voltage Terminations/Splices (10 Hours)

Offers an overview of the NEC® and cable manufacturers' requirements for high voltage terminations and splices.