

## ELECTRICAL III

### 26301-14 Load Calculations - Branch and Feeder Circuits (17.5 Hours)

Explains how to calculate branch circuit and feeder loads for residential and commercial applications.

### 26302-14 Conductor Selection and Calculations (15 Hours)

Covers the factors involved in conductor selection, including insulation types, current-carrying capacity, temperature ratings, and voltage drop.

### 26303-14 Practical Applications of Lighting (12.5 Hours)

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

### 26304-14 Hazardous Locations (15 Hours)

Presents the NEC® requirements for equipment installed in hazardous locations.

### 26305-14 Overcurrent Protection (25 Hours)

Explains how to size and select circuit breakers and fuses for various applications. Also covers short circuit calculations and troubleshooting.

### 26306-14 Distribution Equipment (12.5 Hours)

Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. This module includes blueprints.

### 26307-14 Transformers (12.5 Hours)

Discusses transformer types, construction, connections, protection, and grounding.

### 26308-14 Commercial Electrical Services (10 Hours)

Covers the components, installation considerations, and NEC® requirements for commercial services.

### 26309-14 Motor Calculations (12.5 Hours)

Covers calculations required to size conductors and overcurrent protection for motor applications.

### 26310-14 Voice, Data, and Video (10 Hours)

Covers installation, termination, and testing of voice, data, and video cabling systems.

### 26311-14 Motor Controls (12.5 Hours)

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

## ELECTRICAL IV

### 26401-14 Load Calculations – Feeders and Services (20 Hours)

Topics include basic calculation procedures for commercial and residential applications.

### 26402-14 Health Care Facilities (10 Hours)

Covers the installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.

### 26403-14 Standby and Emergency Systems (10 Hours)

Explains the NEC® requirements for electric generators and storage batteries.

### 26404-14 Basic Electronic Theory (10 Hours)

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

### 26405-14 Fire Alarm Systems (15 Hours)

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

26406-14 Specialty Transformers (10 Hours) Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.

### 26407-14 Advanced Controls (20 Hours)

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

### 26408-14 HVAC Controls (15 Hours)

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

### 26409-14 Heat Tracing and Freeze Protection (10 Hours)

Covers heat tracing systems along with their applications and installation requirements. Motor Operation and Maintenance

### 26410-14 Motor Operation and Maintenance (10 Hours)

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

### 26411-14 Medium-Voltage Terminations and Splices (10 Hours)

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

### 26412-14 Special Locations (20 Hours)

Describes NEC® requirements for selecting and installing equipment, enclosures, and devices in special locations including places of assembly, theaters, carnivals, agricultural buildings, marinas, temporary installations, wired partitions and swimming pools.

### 26413-11 Introductory Skills for The Crew Leader (16 Hours)

Teaches the basic leadership skills required to supervise personnel. Discusses principles of project planning, scheduling, estimating, management, and presents several case studies for student participation.



# Electrical I – IV



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The Barr Construction Institute school admits students of any race, sex, color, religion, national or ethnic origin to all the rights, privileges, programs, activities, admission policies, education policies, scholarships and loan programs generally accorded or made to students at the school. All are encouraged to apply. ABC is an Equal Opportunity/Affirmative Action employer.

# ELECTRICAL I

**00101-15 Basic Safety** (12.5 Hours) Presents basic jobsite safety information to prepare workers for the construction environment. Describes the common causes of workplace incidents and accidents and how to avoid them. Introduces common PPE, including equipment required for work at height, and its proper use. Information related to safety in several specific environments, including welding areas and confined spaces.

**00102-15 Introduction to Construction Math** (10 Hours) Reviews basic mathematical functions and explains their applications to the construction trades. Explains how to use and read various length measurement tools, including standard and metric rulers and tape measures, and the architect's and engineer's scales. Explains decimal-fraction conversions and the metric system, using practical examples. Also reviews basic geometry as applied to common shapes and forms.

**00103-15 Introduction to Hand Tools** (10 Hours) Introduces common hand tools that are widely used in the construction industry, such as hammers, saws, levels, pullers, and clamps. Explains the specific applications of each tool and shows how to use them properly. Also discusses important safety and maintenance issues related to hand tools.

**00104-15 Introduction to Power Tools** (10 Hours) Provides detailed descriptions of commonly used power tools, such as drills, saws, grinders, and sanders. Reviews applications, proper use, safety, and maintenance. Many illustrations show power tools used in on-the-job settings.

**00105-15 Introduction to Construction Drawings** (10 Hours) Familiarizes trainees with basic terms for construction drawings, components, and symbols. Explains the different types of drawings (civil, architectural, structural, mechanical, plumbing/piping, electrical, and fire protection) and instructs trainees on how to interpret and use drawing dimensions. Four oversized drawings are included.

**00106-15 Basic Rigging** (15 Elective Hours) Explains how ropes, chains, hoists, loaders, and cranes are used move material and equipment from one location to another on a job site. Describes inspection techniques and load-handling safety practices. Also reviews American National Standards Institute (ANSI) hand signals.

**00107-15 Basic Communication Skills** (7.5 Hours) Provides trainees with techniques for communicating effectively with co-workers and supervisors. Includes practical examples that emphasize the importance of verbal and written information and instructions on the job. Also discusses effective telephone and e-mail communication skills.

**00108-15 Basic Employability Skills** (7.5 Hours) Identifies the roles of individuals and companies in the construction industry. Introduces trainees to critical thinking and problem solving skills and computer systems and their industry applications. Also reviews effective relationship skills, effective self-presentation, and key workplace issues such as sexual harassment, stress, and substance abuse.

**00109-15 Introduction to Materials Handling** (5 Hours) Recognizes hazards associated with materials handling and explains proper materials handling techniques and procedures. Also introduces materials handling equipment, and identifies appropriate equipment for common job-site tasks.

**26101-14 Orientation to the Electrical Trade** (2.5 hours) Provides an overview of the electrical trade and discusses the career paths available to electricians.

**26102-14 Electrical Safety** (10 hours) Covers safety rules and regulations for electricians. Teaches the necessary precautions to take for various electrical hazards found on the job. Also covers the OSHA-mandated lockout/ tagout procedure.

**26103-14 Introduction to Electrical Circuits** (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.

**26104-14 Electrical Theory** (7.5 hours) Introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

**26105-14 Introduction to the National Electrical code®** (7.5 hours) Provides a navigational road map for using the NEC®. Introduces the layout of the NEC® and the types of information found within the code book. Allows trainees to practice finding information using an easy-to-follow procedure.

**26106-14 Device Boxes** (10 hours) Covers the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. Covers NEC® fill and pull requirements for device, pull, and junction boxes under 100 cubic inches.

**26107-14 Hand Bending** (10 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.

**26108-014 Raceways and Fittings** (20 hours) Introduces the types and applications of raceways, wireways, and ducts. Stresses the appropriate NEC® requirements.

**26109-14 Conductors and Cables** (10 hours) Focuses on the types and applications of conductors and covers proper wiring techniques. Stresses the appropriate NEC® requirements.

**26110-14 Basic Electrical Construction Drawings** (7.5 hours) Focuses on electrical prints, drawings, and symbols. Teaches the types of information that can be found on schematics, one-lines, and wiring diagrams.

**26111-14 Residential Electrical Services** (15 hours) Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the appropriate NEC® requirements.

**26112-14 Electrical Test Equipment** (5 hours) Focuses on proper selection, inspection, and use of common electrical test equipment, including voltage testers, clamp-on ammeters, ohmmeters, multimeters, phase/motor rotation testers, and data recording equipment. Also covers safety precautions and meter category ratings.

# ELECTRICAL II

**26201-14 Alternating Current** (17.5 hours) Focuses on forces that are characteristic of alternating-current systems and the application of Ohm's law to AC circuits.

**26202-14 Motors: Theory and Application** (20 hours) Covers AC and DC motors, including the main components, circuits, and connections.

**26203-14 Electric Lighting** (15 hours) Introduces the basic principles of human vision and the characteristics of light. Focuses on the handling and installation of various types of lamps and lighting fixtures.

**26204-14 Conduit Bending** (15 hours) Covers all types of bends in all sizes of conduit up to 6 inches. Focuses on mechanical, hydraulic, and electrical benders.

**26205-14 Pull and Junction Boxes** (12.5 hours) Driven by the NEC®. Explains how to select and size pull boxes, junction boxes, and handholes.

**26206-14 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.

**26207-14 Cable Tray** (7.5 hours) Focuses on NEC® installation requirements for cable tray, including cable installations.

**26208-14 Conductor Terminations and Splices** (7.5 hours) Describes methods of terminating and splicing conductors of all types and sizes, including preparing and taping conductors.

**26209-14 Grounding and Bonding** (15 hours) Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements.

**26210-14 Circuit Breakers and Fuses** (12.5 hours) Describes fuses and circuit breakers along with their practical applications. Also covers sizing.

**26211-14 Control Systems and Fundamental Concepts** (12.5 hours) Gives basic descriptions of various types of contactors and relays along with their practical applications.