

Electrical Level 1 Course Planning Tools



Course Planning Tools

Electrical Level 1

Occupational Overview: The Electrical Industry



Course Planning Tools

Module 26101-20

26101-20

Occupational Overview: The Electrical Industry

Electrical

Overview

Skilled people in the electrical field are essential to maintain electrical systems and equipment in residential, commercial, and industrial settings. This module describes the various career paths in the electrical industry. It also covers the apprenticeship requirements for electricians and discusses employer/employee responsibilities.

Learning Objective 1

Successful completion of this module prepares trainees to:

Identify the various sectors and trade options in the electrical industry.

- a. Describe the typical components in a residential wiring system.
- b. Describe the typical components in a commercial wiring system.
- c. Describe the typical components in an industrial wiring system.
- d. List various career paths and opportunities in the electrical trade.

Learning Objective 2

Successful completion of this module prepares trainees to:

Understand the apprenticeship/training process for electricians.

- a. List Department of Labor (DOL) requirements for apprenticeship.
- b. Describe various types of training in the electrical field.

Learning Objective 3

Successful completion of this module prepares trainees to:

Understand the responsibilities of the employee and employer.

- a. Identify employee responsibilities.

- b. Identify employer responsibilities.

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Recommended Teaching Time: 2.5 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26101-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Safety for Electricians



Course Planning Tools

Module 26102-20

26102-20

Safety for Electricians

Electrical

Overview

In order to work safely, electricians must be aware of potential hazards and stay constantly alert to them. This includes taking the proper precautions and practicing basic rules of safety. This module discusses hazards and describes the various types of personal protective equipment (PPE) used to reduce injuries. It also covers the standards related to electrical safety and the Occupational Safety and Health Administration (OSHA) lockout/tagout rule.

Learning Objective 1

Successful completion of this module prepares trainees to:

Identify electrical hazards and their effects.

- a. Understand the effects of electrical shock on the human body.
- b. Verify that circuits are de-energized.
- c. Identify causes of electrical incidents.
- d. Explain the hierarchy of risk controls.

Learning Objective 2

Successful completion of this module prepares trainees to:

Use PPE to reduce the risk of injury.

- a. Identify OSHA requirements for protective equipment.
- b. Select and use protective equipment.

Learning Objective 3

Successful completion of this module prepares trainees to:

Identify the standards that relate to electrical safety.

- a. Apply OSHA requirements in the workplace.

- b. Understand the purpose of NFPA 70E[®].

Learning Objective 4

Successful completion of this module prepares trainees to:

Recognize the safety requirements for various hazards.

- a. Identify the safety hazards associated with ladders, scaffolds, and lift equipment.
- b. Avoid back injuries by practicing proper lifting techniques.
- c. Demonstrate basic tool safety.
- d. Identify confined space entry procedures.
- e. Work safely with dangerous materials.
- f. Select and use appropriate fall protection.

Performance Tasks

1. Properly select and use PPE.
2. Describe the safety requirements for an instructor-supplied task, such as replacing the lights in your classroom.
 - Discuss the work to be performed and the hazards involved.
 - If a ladder is required, perform a visual inspection on the ladder and set it up properly.
 - Ensure that local emergency telephone numbers are either posted or known by you and your partner(s).
 - Plan an escape route from the location in the event of an accident.

Recommended Teaching Time: 10 hours

Classroom Equipment and Materials

- Copy of the latest edition of the *National Electrical Code*[®]
- Whiteboard and markers
- Pencils and paper
- PowerPoint[®] Presentations for Module 26102-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access

- Module Review answer key
- Module Examinations

Performance Task 1

- Hard hat, safety goggles, work gloves, fall arrest system, safety harnesses, any other appropriate PPE
- Performance Profile sheets

Performance Task 2

- Ladder
- Appropriate PPE
- Other equipment or materials based on the required task
- Performance Profile sheets

Introduction to Electrical Circuits



Course Planning Tools

Module 26103-20

26103-20

Introduction to Electrical Circuits

Electrical

Overview

All kinds of instruments use electrical circuitry to function. This module discusses basic atomic theory and electrical theory, which are the fundamental concepts behind electricity in every setting. It also covers electrical units of measurement and explains how Ohm's law and the power equation can be used to determine unknown values. This module also includes electrical schematic diagrams.

Learning Objective 1

Successful completion of this module prepares trainees to:

Describe atomic structure as it relates to electricity.

- a. Identify the components of an atom.
- b. Compare the atomic structures of conductors and insulators.
- c. Identify the role of magnetism in electrical devices.
- d. Identify the basic components in a power distribution system.

Learning Objective 2

Successful completion of this module prepares trainees to:

Identify electrical units of measurement.

- a. Define current.
- b. Define voltage.
- c. Define resistance.
- d. Use Ohm's law to solve for unknown circuit values.

Learning Objective 3

Successful completion of this module prepares trainees to:

Read schematic diagrams.

- a. Identify the symbol for a resistor and determine its value based on color codes.
- b. Distinguish between series and parallel circuits.
- c. Identify the instruments used to measure circuit values.
- d. Calculate electrical power.

Performance Tasks

This is a knowledge-based module. There are no performance tasks.

Recommended Teaching Time: 7.5 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26103-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Electrical Theory



Course Planning Tools

Module 26104-20

26104-20

Electrical Theory

Electrical

Overview

Knowledge of electrical circuits is essential in the electrical field. Sound understanding of basic circuits, as well as the methods for calculating the electrical energy within them, forms the foundation for utilizing these principles in practical applications. This module explains how to apply Ohm's law to series, parallel, and series-parallel circuits. It also covers Kirchhoff's voltage and current laws.

Learning Objective 1

Successful completion of this module prepares trainees to:

Calculate values in resistive circuits.

- a. Identify resistances in series.
- b. Identify resistances in parallel.
- c. Simplify series-parallel circuits.
- d. Apply Ohm's law to various types of circuits.

Learning Objective 2

Successful completion of this module prepares trainees to:

Apply Kirchhoff's laws to various types of circuits.

- a. Use Kirchhoff's current law.
- b. Use Kirchhoff's voltage law.

Performance Tasks

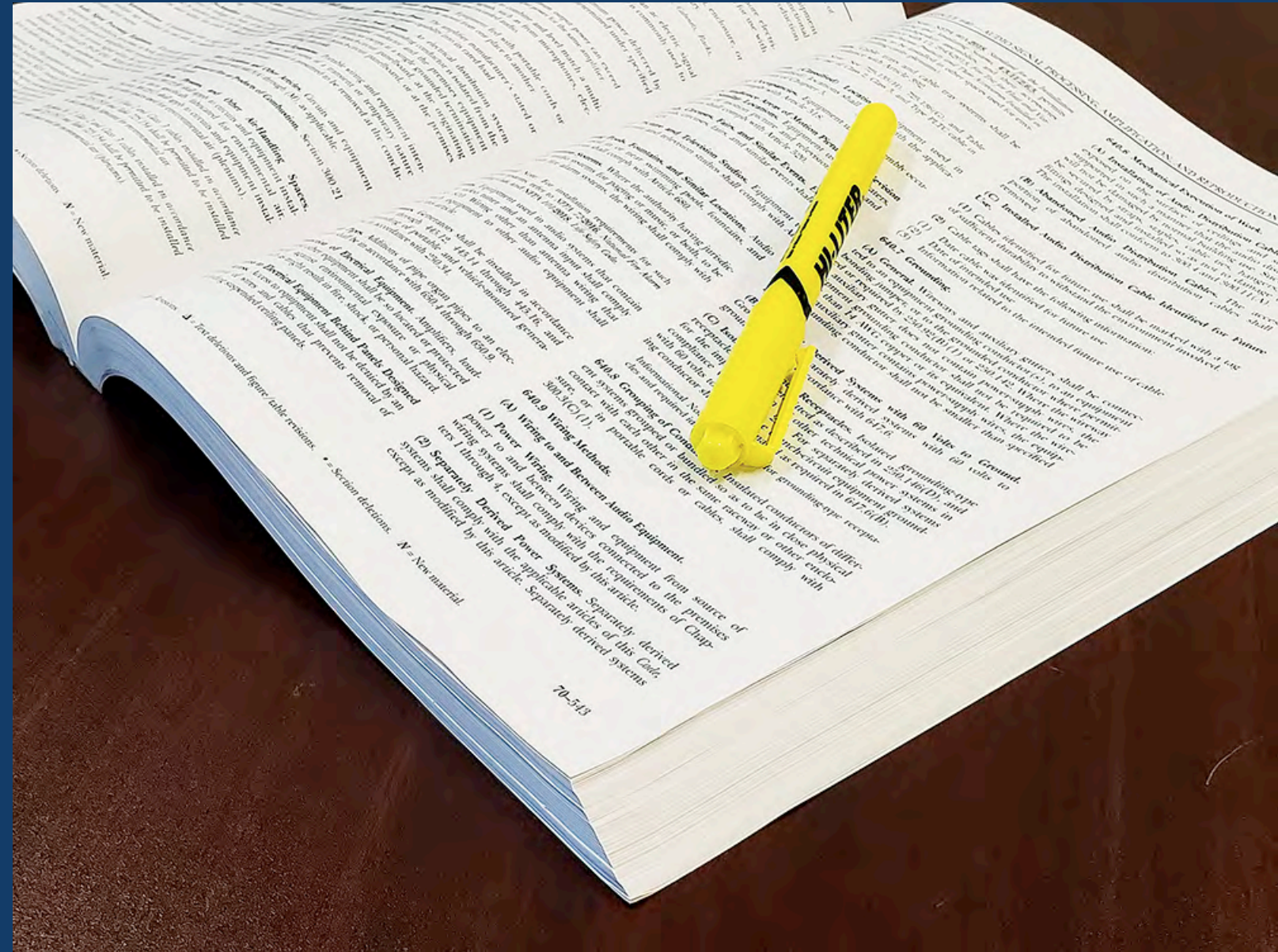
This is a knowledge-based module. There are no performance tasks.

Recommended Teaching Time: 7.5 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26104-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Introduction to the National Electrical Code®



Course Planning Tools

Module 26105-20

26105-20

Introduction to the *National Electrical Code*[®] *Electrical*

Overview

The *NEC*[®] is one of the most important tools for electricians. When used together with the applicable electrical code for your local area, the *NEC*[®] provides the minimum requirements for the installation of electrical systems. This module describes the purpose of the *NEC*[®] and explains how to use it to find the installation requirements for various electrical devices and wiring methods. It also provides an overview of the National Electrical Manufacturers Association and Nationally Recognized Testing Laboratories.

Learning Objective 1

Successful completion of this module prepares trainees to:

Explain the purpose and history of the *NEC*[®].

- a. Identify key dates in the history of the *NEC*[®].
- b. Describe how changes are made to the *NEC*[®].
- c. Identify the other organizations that produce standards for the manufacture and use of electrical products.

Learning Objective 2

Successful completion of this module prepares trainees to:

Navigate the *NEC*[®].

- a. Explain the layout of the *NEC*[®].
- b. Use the *NEC*[®] to find specific installation requirements.

Performance Tasks

1. Use *NEC Article 90* to determine the scope of the *NEC*[®]. State what is covered and what is not covered by the *NEC*[®].
2. Find the definition of the term *feeder* in the *NEC*[®].

3. Look up the *NEC*® requirements needed to install an outlet near a swimming pool.
4. Find the minimum wire bending space required for two No. 1/0 AWG conductors installed in a junction box or cabinet and entering opposite the terminal.

Recommended Teaching Time: 7.5 hours

Classroom Equipment and Materials

- A copy of the *National Electrical Code*®
- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26105-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations

Performance Tasks 1, 2, 3, and 4

- A copy of the *National Electrical Code*®
- Writing utensils and paper
- Performance Profile sheets

Device Boxes



Course Planning Tools

Module 26106-20

26106-20

Device Boxes

Electrical

Overview

Electricians work with device boxes almost every day on every project, making a thorough understanding of the types of boxes available and their applications essential. This module describes the various types of boxes and explains how to calculate the *NEC*[®] fill requirements for outlet and junction boxes under 100 cubic inches (1,650 cubic centimeters).

Learning Objective 1

Successful completion of this module prepares trainees to:

Size and install outlet boxes.

- a. Identify boxes and their applications.
- b. Size outlet boxes.
- c. Install outlet boxes.

Learning Objective 2

Successful completion of this module prepares trainees to:

Size and install pull and junction boxes.

- a. Size pull and junction boxes.
- b. Install pull and junction boxes.

Performance Tasks

1. Identify the appropriate box type and size for a given application.
2. Select the minimum size pull or junction box for the following applications:
 - Conduit entering and exiting for a straight pull.
 - Conduit entering and exiting at an angle.

Recommended Teaching Time: 10 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26106-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Electrician's hand tools
- Examples of different types of metallic and nonmetallic outlet boxes, device covers, and extension rings
- Wire nuts
- NM cable
- Performance Profile sheets

Performance Task 2

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Examples of pull and junction boxes
- Performance Profile sheets

Hand Bending



Course Planning Tools

Module 26107-20

26107-20

Hand Bending

Electrical

Overview

The art of conduit bending is dependent upon the skills of the electrician and requires a working knowledge of basic terms and proven procedures. Practice, knowledge, and training will help you gain the skills necessary for proper conduit bending and installation. This module describes methods for hand bending conduit. It covers 90-degree bends, back-to-back bends, offsets, and saddle bends. It also describes how to cut, ream, and thread conduit.

Learning Objective 1

Successful completion of this module prepares trainees to:

Select and use hand bending equipment.

- a. Use geometry to make a bend.
- b. Make 90° bends.
- c. Make offset bends.

Learning Objective 2

Successful completion of this module prepares trainees to:

Cut, ream, and thread conduit.

- a. Cut conduit using a hacksaw.
- b. Cut conduit using a pipe cutter.
- c. Ream conduit.
- d. Thread conduit.
- e. Cut and join PVC conduit.

Performance Tasks

1. Make 90° bends, back-to-back bends, offsets, and saddle bends using a hand bender.

2. Cut, ream, and thread conduit.

Recommended Teaching Time: 10 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26107-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Hand bender and manufacturer's instructions
- Various pieces of conduit
- Hickey bar
- Manufacturer's gain tables
- PVC heating unit and plug set
- Tape measure
- Calculator
- Performance Profile sheets

Performance Task 2

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Hand bender and manufacturer's instructions
- Various pieces of conduit
- Hickey bar
- Manufacturer's gain tables

- Tape measure
- Calculator
- Hacksaw
- Pipe vise
- Pipe cutter
- Reamer
- Cutting oil
- Shop towels
- Hand-operated threader
- Sandbox or drip pan
- Torpedo level
- Performance Profile sheets

Wireways, Raceways, and Fittings



Course Planning Tools

Module 26108-20

26108-20

Wireways, Raceways, and Fittings

Electrical

Overview

Electrical raceways present challenges and requirements involving proper installation techniques, general understanding of raceway systems, and applications of the *NEC*[®] to raceway systems. Acquiring quality installation skills for raceway systems requires practice, knowledge, and training. This module describes various types of raceway systems, along with their installation and *NEC*[®] requirements. It also describes the use of various conduit bodies.

Learning Objective 1

Successful completion of this module prepares trainees to:

Select and install raceway systems.

- a. Identify types of conduit and their applications.
- b. Properly bond conduit for use as a ground path.
- c. Install metal conduit fittings.
- d. Make conduit-to-box connections.
- e. Identify raceway supports.
- f. Identify installation requirements for various construction methods.

Learning Objective 2

Successful completion of this module prepares trainees to:

Select fasteners and anchors for the installation of raceway systems.

- a. Select and install tie wraps.
- b. Select and install screws.
- c. Select and install hammer-driven pins and studs.
- d. Identify the safety requirements for stud-type guns.
- e. Select and install masonry anchors.
- f. Select and install hollow-wall anchors.

- g. Select and install epoxy anchoring systems.

Learning Objective 3

Successful completion of this module prepares trainees to:

Select and install wireways and other specialty raceways.

- a. Identify types of wireways and their components.
- b. Install wireway supports.
- c. Identify and install specialty raceways.

Learning Objective 4

Successful completion of this module prepares trainees to:

Select and install cable trays.

- a. Identify cable tray types and fittings.
- b. Install cable tray supports.

Learning Objective 5

Successful completion of this module prepares trainees to:

Handle and store raceways.

- a. Handle raceways.
- b. Store raceways.

Performance Tasks

Under the supervision of the instructor, you should be able to do the following:

1. Identify the appropriate conduit body for a given application.
2. Identify and select various types and sizes of raceways, fittings, and fasteners for a given application.
3. Demonstrate how to install a raceway system.
4. Terminate a selected raceway system.

Recommended Teaching Time: 20 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26108-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Various conduit couplings
- Combination couplings
- Offset nipples
- Type C, Type L, Type T, and Type X conduit bodies
- Various types of bushings
- Insulated bushings
- Threaded waterproof hubs
- Seal fittings and packing material
- Liquid sealing compound
- Various straps
- Standoff support
- Framing channel
- Beam clamps
- Performance Profile sheets

Performance Tasks 2, 3, and 4

- Copy of the latest edition of the *National Electrical Code*®
- Concrete, masonry, and wood for fastener application

- Assorted hand tools (wrenches, screwdrivers, hammers)
- Drills/drivers and assorted drill bits
- Hammer-driven tools with related pin and stud fasteners
- Powder-actuated tool, powder charges, and related pin and stud fasteners
- Powder-actuated tool operator's certification training program
- Assorted threaded fasteners such as bolts, cap screws, studs, machine screws, nuts, washers, special threaded fasteners, and tie wraps
- Assorted screws such as wood screws, lag screws and shields, concrete/masonry screws, thread-forming (sheet metal) and thread-cutting screws, deck screws, and drywall screws
- Assorted mechanical anchors and assorted anchor fastening tools such as wedges, studs, sleeves, one-pieces, hammer-drivers, drop-ins, expansion shields, screws (fiber, lead, plastic), self-drilling, toggle bolts, sleeve-type, wallboard, metal drive-in, metal boxes, nonmetallic boxes, and bushings and locknuts
- Performance Profile sheets

Conductors and Cables



Course Planning Tools

Module 26109-20

26109-20

Conductors and Cables

Electrical

Overview

As an electrician, you will be required to select the proper wire and/or cable for a job. You will also be required to pull this wire or cable through conduit runs in order to terminate it. This module discusses conductor types, cable markings, color codes, and ampacity derating. It also describes how to install conductors using fish tape and power conduit fishing systems.

Learning Objective 1

Successful completion of this module prepares trainees to:

Classify conductors by wire size, insulation, and application.

- a. Identify wire sizes.
- b. Determine conductor ampacities.
- c. Identify conductor materials.
- d. Identify conductor insulation.
- e. Identify fixture wiring.
- f. Identify cable types and applications.
- g. Identify instrumentation control wiring.

Learning Objective 2

Successful completion of this module prepares trainees to:

Install conductors in a conduit system.

- a. Install conductors using fish tape.
- b. Install conductors using pulling equipment.

Performance Task

1. Install conductors in a raceway system.

Recommended Teaching Time: 10 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26109-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Appropriate PPE
- Copy of the latest edition of the *National Electrical Code*®
- Electrician's hand tools
- Fish tape
- Rodder
- Pull lines
- Basket grip
- Wire grip
- Power fishing system
- Reel cart
- Manual wire puller
- Power puller
- Performance Profile sheets

Basic Electrical Construction Documents



Course Planning Tools

Module 26110-20

26110-20

Basic Electrical Construction Documents

Electrical

Overview

In all large construction projects and in many of the smaller ones, a professional is commissioned to prepare the construction documents—the complete working drawings and specifications for the project. The drawings include site plans, floor plans, detail drawings, lighting plans, power riser diagrams, and various schedules. The construction documents, along with the contractor's bid, are legal documents binding on the various parties in the construction project and must be maintained and kept correct. This module describes how to interpret electrical drawings, including the use of architect's and engineer's scales.

Learning Objective 1

Successful completion of this module prepares trainees to:

Interpret construction drawings.

- a. Locate the information found in drawing blocks.
- b. Identify the information found on different types of drawings.
- c. Interpret drafting lines.

Learning Objective 2

Successful completion of this module prepares trainees to:

Measure items on scale drawings.

- a. Use an architect's scale.
- b. Use an engineer's scale.
- c. Use a metric scale.

Learning Objective 3

Successful completion of this module prepares trainees to:

Apply the information on electrical drawings.

- a. Interpret electrical symbols.
- b. Check a set of residential electrical drawings.
- c. Locate information within a commercial plan set.
- d. Read schedules, block diagrams, and schematic diagrams.

Learning Objective 4

Successful completion of this module prepares trainees to:

Integrate specifications with electrical drawings.

- a. Select relevant information from written specifications.
- b. Compare two formats for written specifications.
- c. Identify document changes and the need for them.

Performance Tasks

1. Using an architect's scale, state the actual dimensions of a given drawing component.
2. Make a material takeoff of the luminaires specified in the provided drawing. The takeoff requires that all luminaires be counted, and where applicable, the total number of lamps for each luminaire type must be calculated. (Fill these in on the provided Performance Profile Task 2 Worksheet.)

Recommended Teaching Time: 7.5 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26110-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Complete set of construction drawings
- Architect's scales (both flat and triangular)
- Performance Profile sheets

Performance Task 2

- Luminaire drawing
- Luminaire Takeoff worksheets
- Performance Profile sheets

Residential Wiring



Course Planning Tools

Module 26111-20

26111-20

Residential Wiring

Electrical

Overview

When planning any electrical system, there are certain general steps to be followed, regardless of the type of construction. Residential electrical systems are essential for many everyday necessities, including heating and air conditioning, lighting, and household appliances. This module discusses basic load calculations and *NEC*® requirements for residential electrical systems. It also describes how to lay out branch circuits, install wiring, size outlet boxes, and install wiring devices.

Learning Objective 1

Successful completion of this module prepares trainees to:

Size the electric service for a dwelling.

- a. Calculate the electric service load.
- b. Apply demand factors.
- c. Calculate appliance loads.
- d. Size the load center.

Learning Objective 2

Successful completion of this module prepares trainees to:

Identify the grounding requirements for a residential electrical system.

- a. Size grounding electrodes.
- b. Size the main bonding jumper.
- c. Install the equipment grounding system.

Learning Objective 3

Successful completion of this module prepares trainees to:

Install service-entrance equipment.

- a. Identify the service drop location.
- b. Select the panelboard location.

Learning Objective 4

Successful completion of this module prepares trainees to:

Identify wiring methods for various types of residences.

- a. Select and install cable systems.
- b. Select and install raceways.

Learning Objective 5

Successful completion of this module prepares trainees to:

Lay out branch circuits and size outlet boxes.

- a. Complete the branch circuit layout for power.
- b. Complete the branch circuit layout for lighting.
- c. Install outlet boxes.

Learning Objective 6

Successful completion of this module prepares trainees to:

Select and install various wiring devices.

- a. Select and install receptacles.
- b. Select and install switches.
- c. Install devices near residential swimming pools, spas, and hot tubs.

Performance Tasks

1. For a residential dwelling of a given size and equipped with a given list of major appliances, demonstrate or explain how to:
 - Compute lighting, small appliance, and laundry loads.
 - Compute the loads for large appliances.
 - Determine the number of branch circuits required.

- Size and select the service-entrance conductors, panelboard, and protective devices.
2. Using an unlabeled diagram of a panelboard (Performance Profile Task 2 Worksheet), label the lettered components.
 3. Select the proper type and size of outlet box needed for a given set of wiring conditions.

Recommended Teaching Time: 15 hours

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 26111-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations
- A copy of the *National Electrical Code*®

Performance Task 1

- Appropriate PPE
- Blank paper
- Writing utensils
- Calculators
- Residential floor plan
- Blank worksheet for general lighting loads
- Various types of GFCIs
- Panelboard
- Performance Profile sheets

Performance Task 2

- Appropriate PPE
- Writing utensils
- Panelboard for demonstration

- Performance Profile sheets

Performance Task 3

- Appropriate PPE
- Basic electrician's tools, including various wire cutters and cable strippers
- Type NM cable
- An assortment of metallic and plastic outlet boxes
- Performance Profile sheets

Electrical Test Equipment



Course Planning Tools

Module 26112-20

26112-20

Electrical Test Equipment

Electrical

Overview

The test equipment selected for a specific task depends on the type of measurement and the level of accuracy required. This module covers the applications of various types of electrical test equipment. It also describes meter safety precautions and category ratings.

Learning Objective 1

Successful completion of this module prepares trainees to:

Identify various types of electrical test equipment.

- a. Identify the applications of a voltmeter.
- b. Identify the applications of an ohmmeter.
- c. Identify the applications of a clamp-on ammeter.
- d. Identify the applications of a multimeter.
- e. Identify the applications of other meters.

Learning Objective 2

Successful completion of this module prepares trainees to:

Identify meter category ratings and safety requirements.

- a. Select a meter with the correct category rating for an application.
- b. Identify electrical test equipment safety hazards.

Performance Tasks

1. Measure the voltage in the classroom from line to neutral and neutral to ground.
2. Use an ohmmeter to measure the value of various resistors.

Recommended Teaching Time: 5 hours

Classroom Equipment and Materials

- A copy of the *National Electrical Code*[®]
- Whiteboard and markers
- Pencils and paper
- PowerPoint[®] Presentations for Module 26112-20
- A variety of standard marker sizes
- Poster board
- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations

Performance Task 1

- Appropriate PPE as directed by the instructor or training facility provider
- Multimeter
- Access to a 120V circuit
- Performance Profile sheets

Performance Task 2

- Appropriate PPE as directed by the instructor or training facility provider
- Various resistors
- Multimeter