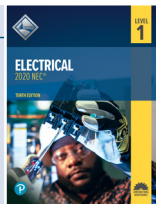


## L1 ELECTRICAL

LEVEL 1



### Curriculum Notes

- 185 Hours
  - Includes 72.5 hours of Core, which is a prerequisite for Level 1 completion and must be purchased separately.
  - Hardcover: \$57.99, ISBN 978-0-13-413143-6
  - Paperback: \$57.99, ISBN 978-0-13-413098-9
- Revised: 2020, Tenth Edition, to reflect 2020 NEC®
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at [www.nccer.org/irc](http://www.nccer.org/irc).
- A Spanish translation of the 2008 NEC® version is available. Please see NCCER's online catalog for more information.

### PAPERBACK

Trainee Guide: \$69.99  
Individual Modules: \$24.99

ISBN

978-0-13-690853-1

see module list

### DIGITAL

NCCERconnect Access Card: \$69.99  
NCCERconnect +

ISBN

Coming Soon

Hardcover Trainee Guide: \$94.99

Coming Soon

NCCERconnect +

Paperback Trainee Guide: \$94.99

Coming Soon

### MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

#### Occupational Overview: The Electrical Industry

(2.5 Hours)

ISBN 978-0-13-690875-3

(Module ID 26101-20) Provides an overview of the electrical craft and discusses the career paths available to electricians, including apprenticeship requirements.

#### Safety For Electricians (10 Hours)

ISBN 978-0-13-690864-7

(Module ID 26102-20) Discusses hazards and describes the various types of personal protective equipment (PPE) used to reduce injuries. Covers the standards related to electrical safety and the OSHA-mandated lockout/tagout rule.

#### Introduction to Electrical Circuits (7.5 Hours)

ISBN 978-0-13-690893-7

(Module ID 26103-20) Introduces electrical concepts used in Ohm's law and how the power equation can be used to determine unknown values. Covers basic atomic theory and electrical theory, electrical schematic diagrams, and electric power equations.

#### Electrical Theory (7.5 Hours)

ISBN 978-0-13-690892-0

(Module ID 26104-20) Introduces basic circuits, as well as the methods for calculating the electrical energy within them. Covers resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis.

#### Introduction to the National Electrical Code

(7.5 Hours)

ISBN 978-0-13-690888-3

(Module ID 26105-20) Introduces the NEC® and explains how to use it to find the installation requirements. Provides an overview of the National Electrical Manufacturers Association and Nationally Recognized Testing Laboratories.

#### Device Boxes (10 Hours)

ISBN 978-0-13-690874-6

(Module ID 26106-20) Describes the various types of boxes and explains how to calculate the NEC® fill requirements for outlet adjunction boxes under 100 cubic inches (1,650 cubic centimeters).

#### Hand Bending (10 Hours)

ISBN 978-0-13-690873-9

(Module ID 26107-20) Covers methods for hand bending conduit, including 90-degree bends, back-to-back bends, offsets, and saddle bends. Describes how to cut, ream, and thread conduit.

#### Wireways, Raceways, and Fittings (20 Hours)

ISBN 978-0-13-690887-6

(Module ID 26108-20) Introduces various types of raceway systems, along with their installation and NEC® requirements. Describes the use of various conduit bodies.

#### Conductors and Cables (10 Hours)

ISBN 978-0-13-690862-3

(Module ID 26109-20) Discusses conductor types, cable markings, color codes, and ampacity derating. Describes how to install conductors using fish tape and power conduit fishing systems.

#### Basic Electrical Construction Documents (7.5 Hours)

ISBN 978-0-13-690884-5

(Module ID 26110-20) Describes how to interpret electrical drawings, including the use of architect's and engineer's scales.

#### Residential Wiring (15 Hours)

ISBN 978-0-13-690885-2

(Module ID 26111-20) Covers basic load calculations and NEC® requirements for residential electrical systems. Describes how to lay out branch circuits, install wiring, size outlet boxes, and install wiring devices.

#### Electrical Test Equipment (5 Hours)

ISBN 978-0-13-690866-1

(Module ID 26112-20) Covers the applications of various types of electrical test equipment. Describes meter safety precautions and category ratings.

## L2 ELECTRICAL

LEVEL 2

### Curriculum Notes

- 145 Hours
- Revised: 2020, Tenth Edition, to reflect 2020 NEC®
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at [www.nccer.org/irc](http://www.nccer.org/irc).

### PAPERBACK

Trainee Guide: \$99.99  
Individual Modules: \$24.99

ISBN

978-013-689782-8

see module list

### DIGITAL

NCCERconnect Access Card: \$99.99  
NCCERconnect +

ISBN

Coming Soon

Hardcover Trainee Guide: \$124.99

Coming Soon

NCCERconnect +

Paperback Trainee Guide: \$124.99

Coming Soon

### MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

#### Alternating Current (17.5 Hours)

ISBN 978-0-13-689729-3

(Module ID 26201-20) Describes AC circuits and explains how to apply Ohm's law to solve for unknown circuit values.

#### Motors: Theory and Application (20 Hours)

ISBN 978-0-13-689718-7

(Module ID 26202-20) Covers AC and DC motors, including the main components, circuits, and connections.

#### Electric Lighting (15 Hours)

ISBN 978-0-13-689723-1

(Module ID 26203-20) Introduces the principles of human vision and the characteristics of light. Covers different types of light sources and the operating characteristics and installation requirements of various lighting fixtures.

#### Conduit Bending (15 Hours)

ISBN 978-0-13-689760-6

(Module ID 26204-20) Describes how to make conduit bends using mechanical, hydraulic, and electric benders.

#### Pull and Junction Boxes (12.5 Hours)

ISBN 978-0-13-689752-1

(Module ID 26205-20) Explains how to size and install pull and junction boxes. Identifies various specialty enclosures, including conduit bodies, FS and FD boxes, and handholes.

#### Conductor Installations (10 Hours)

ISBN 978-0-13-689717-0

(Module ID 26206-20) Describes how to prepare conduit for conductors. Explains how to set up and complete a cable-pulling operation.

#### Cable Tray (7.5 Hours)

ISBN 978-0-13-689749-1

(Module ID 26207-20) Discusses various types of cable tray, supports, and associated fittings. Explains how to determine the loads on a cable tray and calculate fill per NEC® requirements.

#### Conductor Terminations and Splices (7.5 Hours)

ISBN 978-0-13-689711-8

(Module ID 26208-20) Explains how to prepare cable ends for terminations and splices. Describes how to train cable at termination points and describes crimping techniques.

Continued on following page

## Electrical Level 2 (continued)

### Grounding and Bonding (15 Hours)

ISBN 978-0-13-689735-4

(Module ID 26209-20) Explains the grounding and bonding requirements of NEC Article 250. Covers how to size the main and system bonding jumpers and the grounding electrode conductor for various AC systems.

### Circuit Breakers and Fuses (12.5 Hours)

ISBN 978-0-13-689766-8

(Module ID 26210-20) Describes the operating principles of circuit breakers and fuses, and explains how to select and install overcurrent devices.

### Control Systems and Fundamental Concepts

(12.5 Hours)

ISBN 978-0-13-689762-0

(Module ID 26211-20) Describes the operating principles of contactors and relays, including both mechanical and solid-state devices. Explains how to select and install relays and troubleshoot control circuits.

## L3 ELECTRICAL

### LEVEL 3

#### Curriculum Notes

- 155 Hours
- Revised: 2020, Tenth Edition, to reflect 2020 NEC®
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at [www.nccer.org/irc](http://www.nccer.org/irc).

#### PAPERBACK

Trainee Guide: \$99.99  
Individual Modules: \$24.99

#### ISBN

978-0-13-690480-9  
see module list

#### DIGITAL

NCCERconnect Access Card: \$99.99  
NCCERconnect +  
Trainee Guide: \$124.99

#### ISBN

Coming Soon  
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### MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

#### Load Calculations — Branch and Feeder Circuits

(17.5 Hours)

ISBN 978-0-13-690543-1

(Module ID 26301-20) Explains how to calculate branch circuit and feeder loads for residential and commercial applications. Covers various derating factors.

#### Conductor Selection and Calculations (15 Hours)

ISBN 978-0-13-690549-3

(Module ID 26302-20) Explains how to make conductor calculations. Covers other factors involved in conductor selection, including insulation types, current-carrying capacity, temperature ratings, and voltage drop.

#### Practical Applications of Lighting (12.5 Hours)

ISBN 978-0-13-690514-1

(Module ID 26303-20) Describes various luminaires and the types of luminaires suited for various applications. Covers dimming, lighting controls, and energy management systems.

#### Hazardous Locations (15 Hours)

ISBN 978-0-13-690493-9

(Module ID 26304-20) Presents the NEC® requirements for equipment installed in hazardous locations.

#### Overcurrent Protection (25 Hours)

ISBN 978-0-13-690490-8

(Module ID 26305-20) Explains how to size and select circuit breakers and fuses for various applications. Covers short circuit calculations and troubleshooting.

#### Distribution Equipment (12.5 Hours)

ISBN 978-0-13-690513-4

(Module ID 26306-20) Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. Covers ground fault relay testing.

#### Transformers (12.5 Hours)

ISBN 978-0-13-690500-4

(Module ID 26307-20) Describes the construction, operation, and applications of various transformers. Covers transformer connections and grounding requirements.

#### Commercial Electrical Services (10 Hours)

ISBN 978-0-13-690526-4

(Module ID 26308-20) Covers the components, installation considerations, and NEC® requirements for commercial services.

#### Motor Calculations (12.5 Hours)

ISBN 978-0-13-690498-4

(Module ID 26309-20) Covers the calculations required to size the conductors and overcurrent protection required for motor applications.

#### Voice, Data, & Video (10 Hours)

ISBN 978-0-13-690537-0

(Module ID 26310-20) Covers the installation, termination, and testing of these systems.

#### Motor Controls (12.5 Hours)

ISBN 978-0-13-690522-6

(Module ID 26311-20) Provides information on selecting, sizing, and installing motor controllers, as well as control circuit pilot devices and basic relay logic.

## L4 ELECTRICAL

### LEVEL 4

#### Curriculum Notes

- 182.5 Hours
- Revised: 2020, Tenth Edition, to reflect 2020 NEC®
- Downloadable instructor resources that include module tests, PowerPoints®, and performance profile sheets are available at [www.nccer.org/irc](http://www.nccer.org/irc).

#### PAPERBACK

Trainee Guide: \$99.99  
Individual Modules: \$24.99

#### ISBN

978-0-13-691078-7  
see module list

#### DIGITAL

NCCERconnect Access Card: \$99.99  
NCCERconnect +  
Trainee Guide: \$124.99

#### ISBN

Coming Soon  
Coming Soon

### MODULES

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

#### Load Calculations — Feeders & Services (20 Hours)

ISBN 978-0-13-691126-5

(Module ID 26401-20) Covers basic calculations for commercial and residential applications, including raceway fill, conductor derating, and voltage drop.

#### Health Care Facilities (10 Hours)

ISBN 978-0-13-691132-6

(Module ID 26402-20) Covers the installation, alarm system, and backup system requirements of electrical systems in health care facilities, including the requirements for life safety and critical circuits.

#### Standby and Emergency Systems (10 Hours)

ISBN 978-0-13-691103-6

(Module ID 26403-20) Explains the NEC® installation requirements for electric generators and storage batteries used during such emergency situations.

#### Basic Electronic Theory (10 Hours)

ISBN 978-0-13-691092-3

(Module ID 26404-20) Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

#### Fire Alarm Systems (15 Hours)

ISBN 978-0-13-691131-9

(Module ID 26405-20) Explores the technologies, codes, and wiring approaches used to assemble a fire alarm system. Examines installation and troubleshooting techniques.

#### Specialty Transformers (10 Hours)

ISBN 978-0-13-691087-9

(Module ID 26406-20) Covers various types of transformers, and provides information on selecting, sizing, and installing them.

#### Advanced Controls (20 Hours)

ISBN 978-0-13-691100-5

(Module ID 26407-20) Discusses applications and operating principles of various control system components, such as solid-state relays, reduced-voltage starters, and adjustable-frequency drives. Covers basic troubleshooting procedures.

Continued on following page



## Electrical Level 4 (continued)

### **HVAC Controls** (15 Hours)

ISBN 978-0-13-691124-1

(Module ID 26408-20) Provides a basic overview of HVAC systems and their controls. Also covers electrical troubleshooting and NEC® requirements.

### **Heat Tracing and Freeze Protection** (10 Hours)

ISBN 978-0-13-691095-4

(Module ID 26409-20) Presents heat-tracing and freeze-protection systems along with various applications and installation requirements.

### **Motor Operation and Maintenance** (10 Hours)

ISBN 978-0-13-691121-0

(Module ID 26410-20) Covers motor care procedures, including cleaning, testing, and preventive maintenance. Describes basic troubleshooting procedures.

### **Medium-Voltage Terminations/Splices** (10 Hours)

ISBN 978-0-13-691127-2

(Module ID 26411-20) Identifies types of medium-voltage cable and describes how to make various splices and terminations. Covers hi-pot testing.

### **Special Locations** (20 Hours)

ISBN 978-0-13-691118-0

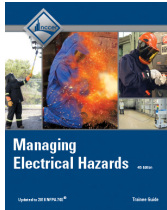
(Module ID 26412-20) Describes the NEC® requirements for selecting and installing equipment, enclosures, and devices for special locations that require unique attention. Locations include places of public assembly, theaters, carnivals, agricultural and livestock facilities, marinas, swimming pools, and temporary facilities.

### **Fundamentals of Crew Leadership** (22.5 Hours)

ISBN 978-0-13-487188-2

(Module ID 46101) Covers basic leadership skills and explains different leadership styles, communication, delegating, and problem solving. Jobsite safety and the crew leader's role in safety are discussed, as well as project planning, scheduling, and estimating. Includes performance tasks to assist the learning process.

## Managing Electrical Hazards



12.5 Hours  
Updated in 2018.  
Module ID 26501

**PAPERBACK**

Trainee Guide: \$29.99

**ISBN**

**978-0-13-518319-9**

- A copy of NFPA 70E®, *Standard for Electrical Safety in the Workplace*, 2018 Edition, is required material for this course. To order, contact NFPA at [www.nfpa.org](http://www.nfpa.org) or 1-800-344-3555.

Introduces electrical hazards in the workplace and describes how to avoid them. Explains how to analyze and document shock and arc flash hazards, and how to plan and conduct work around them. Includes examples of how to complete an energized electrical work permit, and how to select the specialized personal protective equipment required for electrical work.

## Advanced Electrical Topics

Much of the technology in emerging fields—such as wireless, integrated, and voice and data systems—has evolved greatly since the publication of *Advanced Electrical Topics Volumes One and Two*. Because of this, NCCER and Pearson suggest that those teaching a five-year electrical apprenticeship program use the following compilation of modules drawn from EST and Instrumentation.

Trainee Guide: \$109.99      **ISBN 978-0-13-606502-9**

Cable Selection	33208-10
Wire and Cable Terminations	33209-10
CCTV Systems	33410-12
Access Control Systems	33411-12
Buses and Networks	33301-11
Fiber Optics	33302-11
Programmable Logic Controllers	12406-03
Broadband Systems	33403-12
Distributed Control Systems	12407-03
Intrusion Detection Systems	33407-12
Audio Systems	33401-12
Overview of Nurse Call and Signaling Systems	33409-12

