

## Electrical Level 2 (continued)

### Pull and Junction Boxes (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480498-9  
 Instructor \$20 ISBN 978-0-13-480507-8  
 (Module ID 26205-17) Explains how to select and size pull boxes, junction boxes, and handholes.

### Conductor Installations (10 Hours)

Trainee \$20 ISBN 978-0-13-480499-6  
 Instructor \$20 ISBN 978-0-13-480501-6  
 (Module ID 26206-17) 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 (7.5 Hours)

Trainee \$20 ISBN 978-0-13-480502-3  
 Instructor \$20 ISBN 978-0-13-480503-0  
 (Module ID 26207-17) Focuses on NEC® installation requirements for cable tray, including cable installations.

### Conductor Terminations and Splices (7.5 Hours)

Trainee \$20 ISBN 978-0-13-480504-7  
 Instructor \$20 ISBN 978-0-13-480505-4  
 (Module ID 26208-17) Describes methods of terminating and splicing conductors, including preparing and taping conductors.

### Grounding and Bonding (15 Hours)

Trainee \$20 ISBN 978-0-13-480506-1  
 Instructor \$20 ISBN 978-0-13-480508-5  
 (Module ID 26209-17) Focuses on the purpose of grounding and bonding electrical systems. Thoroughly covers NEC® requirements.

### Circuit Breakers and Fuses (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480509-2  
 Instructor \$20 ISBN 978-0-13-480510-8  
 (Module ID 26210-17) Describes fuses and circuit breakers along with their practical applications. Also covers sizing.

### Control Systems and Fundamental Concepts (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480511-5  
 Instructor \$20 ISBN 978-0-13-480512-2  
 (Module ID 26211-17) Gives basic descriptions of various types of contactors and relays along with their practical applications.

Ordering information for *Electrical Level 2*, Eighth Edition:

**HARDCOVER** ISBN  
 Trainee Guide: \$99 978-0-13-383072-9

**PAPERBACK** ISBN  
 Trainee Guide: \$97 978-0-13-383065-1  
 Instructor's Guide: \$97 978-0-13-383073-6

NCCERconnect Access Card: \$97 978-0-13-415698-9

NCCERconnect +  
 Hardcover Trainee Guide: \$124 978-0-13-439123-6

NCCERconnect +  
 Paperback Trainee Guide: \$122 978-0-13-427464-5

## L3 ELECTRICAL

LEVEL 3

**Curriculum Notes** REVISED!

- 155 Hours
- To Be Revised: Summer 2017, Ninth Edition, to reflect 2017 NEC®; visit [www.nccer.org/book-updates](http://www.nccer.org/book-updates) for up-to-date availability status.

- For Online Instructor Resources visit [www.nccerirc.com](http://www.nccerirc.com)

### PAPERBACK

### ISBN

Trainee Guide: \$97 978-0-13-473823-9  
 Instructor's Guide: \$97 978-0-13-480625-9

NCCERconnect is available for this edition; visit [www.nccer.org/online-solutions](http://www.nccer.org/online-solutions) for more information

### MODULES

All of the modules listed below are included in the Trainee Guide and the Instructor's Guide. The following ISBN and pricing information is for ordering individual modules only.

### Load Calculations — Branch and Feeder Circuits (17.5 Hours)

Trainee \$20 ISBN 978-0-13-480513-9  
 Instructor \$20 ISBN 978-0-13-480520-7  
 (Module ID 26301-17) Explains how to calculate branch circuit and feeder loads for residential and commercial applications.

### Conductor Selection and Calculations (15 Hours)

Trainee \$20 ISBN 978-0-13-480514-6  
 Instructor \$20 ISBN 978-0-13-480521-4  
 (Module ID 26302-17) Covers the factors involved in conductor selection, including insulation types, current-carrying capacity, temperature ratings, and voltage drop.

### Practical Applications of Lighting (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480515-3  
 Instructor \$20 ISBN 978-0-13-480516-0  
 (Module ID 26303-17) Describes specific types of incandescent, fluorescent, and HID lamps, as well as ballasts. Also covers troubleshooting and various types of lighting controls.

### Hazardous Locations (15 Hours)

Trainee \$20 ISBN 978-0-13-480522-1  
 Instructor \$20 ISBN 978-0-13-480517-7  
 (Module ID 26304-17) Presents the NEC® requirements for equipment installed in hazardous locations.

### Overcurrent Protection (25 Hours)

Trainee \$20 ISBN 978-0-13-480523-8  
 Instructor \$20 ISBN 978-0-13-480519-1  
 (Module ID 26305-17) Explains how to size and select circuit breakers and fuses for various applications. Also covers short circuit calculations and troubleshooting.

### Distribution Equipment (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480524-5  
 Instructor \$20 ISBN 978-0-13-480525-2  
 (Module ID 26306-17) Discusses switchboards and switchgear, including installation, grounding, and maintenance requirements. Includes a set of drawings.

### Transformers (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480527-6  
 Instructor \$20 ISBN 978-0-13-480528-3  
 (Module ID 26307-17) Discusses transformer types, construction, connections, protection, and grounding.

### Commercial Electrical Services (10 Hours)

Trainee \$20 ISBN 978-0-13-480530-6  
 Instructor \$20 ISBN 978-0-13-480529-0  
 (Module ID 26308-17) Covers the components, installation considerations, and NEC® requirements for commercial services.

### Motor Calculations (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480531-3  
 Instructor \$20 ISBN 978-0-13-480532-0  
 (Module ID 26309-17) Covers calculations required to size conductors and overcurrent protection for motor applications.

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

Trainee \$20 ISBN 978-0-13-480533-7  
 Instructor \$20 ISBN 978-0-13-480532-1  
 (Module ID 26310-17) Covers installation, termination, and testing of voice, data, and video cabling systems.

### Motor Controls (12.5 Hours)

Trainee \$20 ISBN 978-0-13-480536-8  
 Instructor \$20 ISBN 978-0-13-480537-5  
 (Module ID 26311-14) Provides information on selecting, sizing, and installing motor controllers. Also covers control circuit pilot devices and basic relay logic.

Ordering information for *Electrical Level 3*, Eighth Edition:

**PAPERBACK** ISBN

Trainee Guide: \$97 978-0-13-383082-8  
 Instructor's Guide: \$97 978-0-13-383545-8

NCCERconnect Access Card: \$97 978-0-13-415700-9

NCCERconnect +  
 Trainee Guide: \$122 978-0-13-427463-8

## L4 ELECTRICAL

LEVEL 4

**Curriculum Notes** REVISED!

- 180 Hours
- To Be Revised: Summer 2017, Ninth Edition, to reflect 2017 NEC®; visit [www.nccer.org/book-updates](http://www.nccer.org/book-updates) for up-to-date availability status.
- For Online Instructor Resources visit [www.nccerirc.com](http://www.nccerirc.com)

### PAPERBACK

### ISBN

Trainee Guide: \$97 978-0-13-473822-2  
 Instructor's Guide: \$97 978-0-13-480627-3

NCCERconnect is available for this edition; visit [www.nccer.org/online-solutions](http://www.nccer.org/online-solutions) for more information

### MODULES

All of the modules listed below are included in the Trainee Guide and the Instructor's Guide. The following ISBN and pricing information is for ordering individual modules only.

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

Trainee \$20 ISBN 978-0-13-480538-2  
 Instructor \$20 ISBN 978-0-13-480539-9  
 (Module ID 26401-17) Topics include basic calculation procedures for commercial and residential applications.

### Health Care Facilities (10 Hours)

Trainee \$20 ISBN 978-0-13-480540-5  
 Instructor \$20 ISBN 978-0-13-480541-2  
 (Module ID 26402-17) Covers the installation of electric circuits in health care facilities, including the requirements for life safety and critical circuits.



## Electrical Level 4 (continued)

### Standby and Emergency Systems (10 Hours)

Trainee \$20 ISBN 978-0-13-480543-6  
 Instructor \$20 ISBN 978-0-13-480544-3  
 (Module ID 26403-17) Explains the NEC® requirements for electric generators and storage batteries.

### Basic Electronic Theory (10 Hours)

Trainee \$20 ISBN 978-0-13-480546-7  
 Instructor \$20 ISBN 978-0-13-480545-0  
 (Module ID 26404-17) Explains the function and operation of basic electronic devices, including semiconductors, diodes, rectifiers, and transistors.

### Fire Alarm Systems (15 Hours)

Trainee \$20 ISBN 978-0-13-480547-4  
 Instructor \$20 ISBN 978-0-13-480548-1  
 (Module ID 26405-17) Covers fire alarm control units, Digital Alarm Communicator Systems (DACS), wiring for alarm initiating and notification devices, and alarm system maintenance.

### Specialty Transformers (10 Hours)

Trainee \$20 ISBN 978-0-13-480549-8  
 Instructor \$20 ISBN 978-0-13-480550-4  
 (Module ID 26406-17) Covers various types of transformers and their applications. Also provides information on selecting, sizing, and installing these devices.

### Advanced Controls (20 Hours)

Trainee \$20 ISBN 978-0-13-480551-1  
 Instructor \$20 ISBN 978-0-13-480552-8  
 (Module ID 26407-17) Discusses applications and operating principles of solid-state controls, reduced-voltage starters, and adjustable frequency drives. Also covers basic troubleshooting procedures.

### HVAC Controls (15 Hours)

Trainee \$20 ISBN 978-0-13-480553-5  
 Instructor \$20 ISBN 978-0-13-480554-2  
 (Module ID 26408-17) Provides a basic overview of HVAC systems and their controls. Also covers electrical troubleshooting and NEC® requirements.

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

Trainee \$20 ISBN 978-0-13-480555-9  
 Instructor \$20 ISBN 978-0-13-480556-6  
 (Module ID 26409-17) Covers heat tracing systems along with their applications and installation requirements.

### Motor Operation and Maintenance (10 Hours)

Trainee \$20 ISBN 978-0-13-480557-3  
 Instructor \$20 ISBN 978-0-13-480558-0  
 (Module ID 26410-17) Covers motor cleaning, testing, and preventive maintenance. Also describes basic troubleshooting procedures.

### Medium-Voltage Terminations/Splices

(10 Hours)  
 Trainee \$20 ISBN 978-0-13-480561-0  
 Instructor \$20 ISBN 978-0-13-480560-3  
 (Module ID 26411-17) Offers an overview of the NEC® and cable manufacturers' requirements for medium-voltage terminations and splices.

### Special Locations (20 Hours)

Trainee \$20 ISBN 978-0-13-480562-7  
 Instructor \$20 ISBN 978-0-13-480563-4  
 (Module ID 26412-17) 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.

### Fundamentals of Crew Leadership (20 Hours)

(Module ID 46101-11; see p. 69)  
 Trainee \$43 ISBN 978-0-13-293711-5  
 Instructor \$43 ISBN 978-0-13-293726-9

#### Ordering information for *Electrical Level 4*, Eighth Edition:

PAPERBACK	ISBN
Trainee Guide: \$97	978-0-13-382315-8
Instructor's Guide: \$97	978-0-13-382333-2
NCCERconnect Access Card: \$97	978-0-13-415702-3
NCCERconnect + Trainee Guide: \$122	978-0-13-427454-6

## Managing Electrical Hazards



12.5 Hours  
 Updated: 2015, Third Edition  
 Module ID 26501-15

### PAPERBACK

Trainee Guide: \$25  
 Instructor's Guide: \$25

### ISBN

978-0-13-416312-3  
 978-0-13-413115-3

- A copy of NFPA 70E®, *Standard for Electrical Safety in the Workplace*, 2015 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.

### BINDER

Trainee Guide: \$105 ISBN 978-0-13-606502-9  
 Instructor's Guide: \$105 ISBN 978-0-13-606503-6

Cable Selection	33208-11
Wire and Cable Terminations	33209-11
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

