

Agenda

Presented by Larren K. Elliott, Ph.D.

Chapter 1: 2014 National Electrical Code and 2017 NEC Changes

Brief history of the electrical code and explanation of the format of the code:
chapters, articles, part, sub-part etc.
Twenty important changes in the 2017 edition of the NEC

Chapter 2: Wiring and Protection

Grounded conductors
Voltage drop calculations (using Table 8, Chapter 9 resistance values)
Branch circuit, feeder and services calculations
New GFCI receptacle outlet requirements
Service requirements (Article 230)

Grounding and Bonding (Article 250)

New grounding of service entrances
Grounding of separately-derived systems
• Grounding electrodes
Sizing of grounding electrode conductor (Table 250.66)
Bonding of services (Part V)

Chapter 3: Wiring Methods and Materials

Wiring methods—underground installation requirements (Article 300.5)
Conductors for general wiring
• New tables for conductor ampacity (Table 310.15(B)(16))
Conductor ampacity correction and adjustments
Pull and junction box fill calculation (Article 314)

Chapter 4: Equipment for General Use

Flexible cords and cables	New receptacle requirements
Switchboards and panel boards	New short circuit rating
Motor branch and feeder circuits	Luminaires, appliances
Transformer protection (Article 450 example calculations)	

Chapter 5: Special Occupancies

Hazardous locations	Commercial garages
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Chapter 6: Special Equipment

Signs, outline lighting, elevators	Hybrid vehicle plug in requirements
New data center requirements	Solar photovoltaic systems (Article 690)
New small wind turbine systems	

Chapter 7: Special Conditions

New emergency systems (legally required, optional)
Class 1, 2, and 3 power-limited circuits (Article 725)
Fire alarm circuits (Article 760)

Chapter 8: Communications Circuits

New premises-powered broadband communication systems (Article 840)
Network-powered broadband communication systems (Article 830)

Chapter 9: Tables

Conductor fill and raceway calculations with examples
Table 8, Chapter 9 Physical Properties of Conductors
Table 5, Chapter 9 Dimensions of Insulated Conductors and Fixture Wire
Table 4, Chapter 9 Dimensions and Percentage of Conduit and Tubing

Montana Electrical Code
Helena, MT - Thursday, September 19, 2019



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Learning Objectives

You'll be able to:

Learn about the 2014 National Electrical Code as well as the major changes in the 2017 National Electrical Code.

Understand the regulations regarding grounded conductors, GFCI protection, and underground installation of wiring.

Comply with rules that apply to flexible cords and cables, luminaries, and appliances.

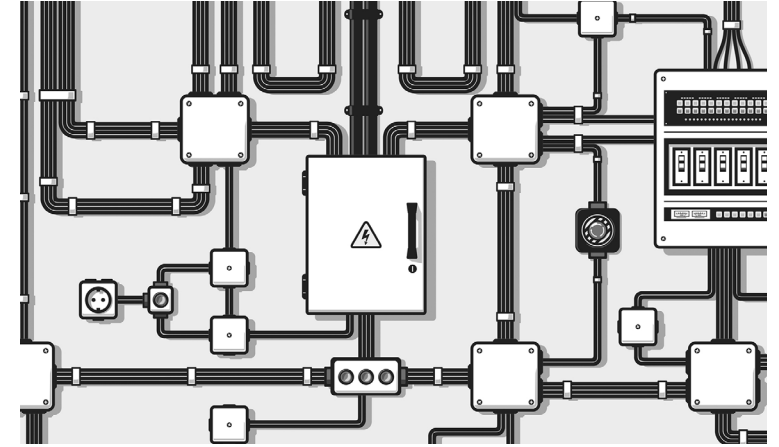
Understand requirements for premises- and network-powered broadband communication systems.

Learn about hybrid vehicle plug in requirements, data center requirements as well as small wind turbine system requirements.



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Review the 2014 National Electrical Code as well as major changes in the 2017 NEC

Learn about the requirements for special occupancies such as commercial garages and hazardous locations

Review wiring methods and materials including new GFCI receptacle outlet requirements

Discuss code requirements for equipment for general use

Understand requirements for emergency systems and fire alarm circuits

Continuing Education Credits

Professional Engineers

6.5 PDHs
6.5 MSE PDHs

International Code Council

.65 CEUs (Electrical)

Architects

6.5 HSW CE Hours
6.5 AIA LU|HSW



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Faculty

Larren K. Elliott, Ph.D. *President, Training Technology, Austin*

Mr. Elliott started his career in the late 60s as an electrician. From that he moved to designing electrical control circuits on material handling systems for the Webb Stiles Company. He later became the supervisor of curriculum and instruction for all industrial control products at the Allen-Bradley Company. Mr. Elliott has also been an assistant professor at Texas A&M University teaching Industrial Electricity and Factory Automation within the School of Engineering. Over the years he has received a B.S. degree in Education from West Virginia University and M.B.A. and Ph.D. degrees from Texas A&M University. He has also passed his Electrical Inspector's Exam certified by the International Association of Electrical Inspectors (IAEI). Mr. Elliott's 45 years of practical hands-on industrial and training experience has given him the ability to teach diverse technical subjects to plant and machine operators, technicians, and engineers.

Here's what past attendees had to say about the program and presenter Larren Elliott:

"Good course with an excellent teacher." — *Facility Engineer*

"Presentation was fantastic. Instructor kept my attention and was engaging. Very knowledgeable!" — *Electrical Engineer*

"Great instructor. He is knowledgeable and very good at teaching." — *Designer*

"Outstanding presentation." — *Building Official*

Seminar Information

Delta Hotels Helena Colonial	Registration	Lunch (On your own)
2301 Colonial Drive	8:00 - 8:30 am	12:30 - 1:30 pm
Helena, MT 59601	Morning Session	Afternoon Session
(406) 443-2100	8:30 am - 12:30 pm	1:30 - 4:30 pm

Tuition

\$289 for individual registration

\$269 for three or more simultaneous registrations.

Included with your registration:

Complimentary continental breakfast and printed seminar manual. Registration does not include a copy of the Code itself.

Receive a reduced tuition rate of \$101 by registering to be our on-site coordinator for the day. For availability and job description, please visit www.halfmoonseminars.org.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar or the self-study package. You may also send another person to take your place.

Additional Learning

Webinar Series

- Structural Design and Ethics**

 - **Structural Design: Ethical Issues**
Thurs., August 15, 2019, 11:00 AM - 12:00 PM CDT
 - **Structural Design: Gravity Forces**
Thurs., August 15, 2019, 12:30 - 2:30 PM CDT
 - **Structural Design: Lateral Forces**
Fri., August 16, 2019, 11:00 AM - 12:30 PM CDT
 - **Structural Design: Wind, Seismic and Connections**
Fri., August 16, 2019, 1:00 - 2:30 PM CDT
- Technical Writing**

 - **Planning Documents**
Wed., August 14, 2019, 11:00 AM - 1:00 PM CDT
 - **Writing Documents**
Wednesday, August 14, 2019, 1:30 - 3:30 PM CDT
 - **Revising and Editing Documents**
Thurs., August 15, 2019, 11:00 AM - 1:00 PM CDT
 - **Technical Writing Best Practices**
Thurs., August 15, 2019, 1:30 - 3:30 PM CDT
- Introduction to Hydro Energy Logic Modeling Software (HELP-FL)**

 - **Introduction to Hydro Energy Logic Program Modeling Software (HELP-FL), Part I**
Tues., August 20, 2019, 11:00 AM - 2:00 PM CDT
 - **Introduction to Hydro Energy Logic Program Modeling Software (HELP-FL), Part II**
Wed., August 21, 2019, 11:00 AM - 2:30 PM CDT
- Small Wind Energy Systems**

 - **Small Wind Energy System Components**
Thurs., August 22, 2019, 11:00 AM - 1:00 PM CDT
 - **Small Wind Energy Siting and Sizing**
Fri., August 23, 2019, 11:00 AM - 1:00 PM CDT
- Deep Foundations and Excavations**

 - **Earth Retention**
Tues., August 27, 2019, 11:00 AM - 1:30 PM CDT
 - **Deep Foundations**
Wed., August 28, 2019, 11:00 AM - 1:30 PM CDT

For more information visit: www.halfmoonseminars.org/webinars/

Continuing Education Credit Information

This seminar is open to the public and offers 6.5 PDHs to professional engineers and 6.5 HSW continuing education hours to architects in Montana. Educators and courses are not subject to preapproval in Montana.

The Montana Society of Engineers has approved this course for 6.5 PDHs.

This seminar has been approved by the American Institute of Architects for 6.5 LU|HSW (Sponsor No. J885). Only full attendance can be reported to the AIA/CES. Visit www.halfmoonseminars.org for complete AIA information under this course listing.

The International Code Council has approved this course for .65 CEUs in the specialty area of Electrical (Preferred Provider No. 1232).

HalfMoon Education will not be seeking course approval from the Montana State Electrical Board for this activity.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Can't Attend? Order the Manual and Audio from the Live Seminar as a Self-Study Package!

Audio recordings of this seminar are available for purchase starting at \$269. See registration panel for more information and please refer to specific state licensing rules or certification requirements to determine if this learning method is eligible for continuing education credit.

Registration

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How to Register	
Online: www.halfmoonseminars.org	
Phone: 715-835-5900	
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Complete the entire form. Attach duplicates if necessary.	
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Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.	
() I need special accommodations. Please contact me.	

Tuition	
() I will be attending the live seminar. Single Registrant - \$289.00 . Three or more registrants from the same company registering at the same time - \$269.00 each.	
() I am not attending. Please send me the self-study package:	
☐ Downloadable MP3 Audio/PDF Manual for \$269.00 .	
☐ CD/Manual Package for \$289.00 .	
(S&H included. Please allow five weeks from seminar date for delivery)	
Checks: Make payable to HalfMoon Education Inc.	
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