# All Course Descriptions

NEC Changes	
2023 NEC	3
Analysis of the 2023 NEC Changes	
2023 NEC Review of Changes for Services, Feeders, & Branch Circuits	4
2023 NEC Changes for Electricians	4
2023 NEC Changes CH 1-4 (General Requirements for Wiring & Equipment)	5
2023 NEC Changes CH 5-8 (Specific Requirements & Communications Systems)	5
2023 NEC Changes Impacting Pools, Hot Tubs, Fountains	6
Top 25 Changes in the 2023 NEC	6
2020 NEC	7
2020 NEC Changes Part 1 Art 90-314	7
2020 NEC Changes Part 2 Art 400-805	7
Overview of the 2020 NEC Changes	
Code Related	9
2023 NEC	9
2023 Bonding and Grounding Review	9
2023 Field Applications for Bonding and Grounding	10
2023 General Requirements for Bonding and Grounding	11
2023 Understanding Solar PV and Energy Storage Systems	11
2023 Limited Energy and Communication Systems	11
2020 NEC	12
2020 Grounding vs Bonding	12
2020 NEC Requirements for Solar PV Systems	12
2020 Limited Energy and Communication Systems	13
2020 Wiring Methods and Materials	13
Industry Related	14
Dwelling Unit Calculations (2023 Version)	14
NFPA 70e Electrical Safety Review (2021 edition)	14
Electrical Theory Review	15
Theory 1 - Electrical Fundamentals/Basic Electricity	15
Theory 2 - Electrical Circuits, Systems, Protection	15
Theory 3 - Alternating Current, Motors, Generators, Transformers	16
Understanding Basic Motor Controls	16
Business and Finance	
Business Management Part 1	17

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Business Management Part 2	
Estimating Fundamentals	
Estimating and Bidding	
Estimating – The Basics	
Estimating – Preparing to Bid the Job	19

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# NEC Changes

# 2023 NEC

# Analysis of the 2023 NEC Changes

Why it's Great	Topics Covered
<ul> <li>Why it's Great</li> <li>This is our best-selling Code Changes course! This course covers important changes made to Article 90 - Chapter 8, including updates to requirements for equipment, wiring, grounding, and special occupancies. With full-color illustrations, real-world examples, and expert analysis, you'll gain the knowledge and skills necessary to ensure your electrical installations comply with the latest standards.</li> <li>Stay up-to-date with the latest 2023 NEC changes with this comprehensive program covering key articles</li> </ul>	<ul> <li>Topics Covered</li> <li>Article 90 - Introduction to the NEC</li> <li>Article 225 - Outside Branch Circuits and Feeders</li> <li>Article 310 - Conductors for General Wiring</li> <li>Article 352 - Rigid Polyvinyl Chloride Conduit (PVC)</li> <li>Article 358 - Electrical Metallic Tubing</li> <li>Article 408 - Switchboards and Panelboards</li> <li>Article 410 - Luminaires, Lampholders, and Lamps</li> <li>Article 422 - Appliances</li> <li>Article 440 - Air-Conditioning and Refrigeration Equip.</li> <li>Article 500 - Hazardous (Classified) Locations</li> <li>Article 555 - Marinas, Boatyards, Commercial and Noncommercial Docking Facilities</li> <li>Article 445 - Generators</li> <li>Article 620 - Elevators, Escalators, and Moving Walks, Platform Lifts, and Stairway Chair Lifts</li> <li>Article 630 - Electric Welders</li> <li>Article 700 - Emergency Systems</li> <li>Article 702 - Optional Standby Systems</li> <li>Article 706 - Energy Storage Systems</li> </ul>
	<ul> <li>Article 700 - Emergency Systems</li> <li>Article 702 - Optional Standby Systems</li> <li>Article 706 - Energy Storage Systems</li> <li>Article 750 - Energy Management Systems</li> <li>Article 800 - General Req for Comm. Systems</li> </ul>

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## 2023 NEC Review of Changes for Services, Feeders, & Branch Circuits

Why it's Great	Topics Covered
Gain a solid understanding of the changes focusing on	✓ Article 90 - Introduction to the NEC
Services, Feeders, & Branch Circuits covered in the 2023	✓ Article 110 - Requirements for Electrical
NEC. This course was expertly designed to provide you	Installations
with an in-depth analysis of the changes that impact	✓ Article 200 - Use and Identification of Grounded
these electrical installations. Our course offers full-color	Conductors
illustrations that provide a visual representation of the	✓ Article 210 - Branch Circuits
concepts being taught. The author's analysis, technical	✓ Article 215 - Feeders
clarifications, and detailed commentary offer a thorough	✓ Article 220 - Branch-Circuit, Feeder, and Service
understanding of the changes impacting the articles you	Load Calculations
frequently deal with.	✓ Article 225 - Outside Branch Circuits and Feeders
	✓ Article 230 - Services
	✓ Article 240 - Overcurrent Protection
	✓ Article 242 - Overvoltage Protection

# 2023 NEC Changes for Electricians

Why it's Great	Topics Covered
Stay up to date on your Code knowledge with the 2023	✓ Article 210 - Branch Circuits
NEC Changes for Electricians course. This course provides	✓ Article 215 - Feeders
a condensed yet comprehensive review of critical	✓ Article 310 - Conductors for General Wiring
changes in the latest Code. With Mike Holt's expert	✓ Article 330 – Metal-Clad Cable
analysis and technical clarifications, you'll gain a clear	✓ Article 352 - Rigid Polyvinyl Chloride Conduit
understanding of the updated Code rules and their	(PVC)
practical applications. Plus, full-color illustrations and	✓ Article 358 - Electrical Metallic Tubing
real-world scenarios reinforce what you've learned to	✓ Article 404 - Switches
help you retain the information and apply in everyday	✓ Article 408 - Switchboards and Panelboards
installations.	✓ Article 410 - Luminaires, Lampholders, and Lamps
You'll cover essential topics such as Branch Circuits,	✓ Article 630 - Electric Welders
Feeders, Conductors for General Wiring, Metal-Clad	
Cable, Rigid Polyvinyl Chloride Conduit (PVC), Electrical	
Metallic Tubing, Switches, Switchboards and	
Panelboards, Luminaires, Lampholders, Lamps, and	
Electric Welders.	

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# 2023 NEC Changes CH 1-4 (General Requirements for Wiring & Equipment)

Why it's Great	Topics Covered
Earn your CEUs and upgrade your electrical knowledge	✓ Article 90 - Introduction to the NEC
with this course! You'll review the significant changes in	✓ Article 225 - Outside Branch Circuits and Feeders
the 2023 NEC for General Requirements for Wiring &	✓ Article 310 - Conductors for General Wiring
Equipment as outlined in Article 90 through Chapter 4.	✓ Article 352 - Rigid Polyvinyl Chloride Conduit
Through engaging full-color illustrations, author analysis,	(PVC)
technical clarifications, and detailed commentary, you'll	✓ Article 358 - Electrical Metallic Tubing
explore critical updates that impact electrical	<ul> <li>Article 408 - Switchboards and Panelboards</li> </ul>
installations.	✓ Article 410 - Luminaires, Lampholders, and Lamps
Stay up-to-date with the latest 2023 NEC changes with	✓ Article 422 - Appliances
this comprehensive program covering key articles	✓ Article 440 - Air-Conditioning and Refrigeration
	Equipment

# 2023 NEC Changes CH 5-8 (Specific Requirements & Communications Systems)

Why it's Great	Topics Covered
Earn your CEUs and upgrade your electrical knowledge	✓ Article 500 - Hazardous (Classified) Locations
with this course! You'll review the significant changes in	✓ Article 555 - Marinas, Boatyards, Commercial and
the 2023 NEC for Specific Requirements &	Noncommercial Docking Facilities
Communications Systems as outlined in Chapter 5-8.	✓ Article 445 - Generators
Through engaging full-color illustrations, author analysis,	✓ Article 620 - Elevators, Escalators, and Moving
technical clarifications, and detailed commentary, you'll	Walks, Platform Lifts, and Stairway Chair Lifts
explore critical updates that impact electrical	✓ Article 625 - Electric Vehicle Power Transfer
installations.	System
Stay up-to-date with the latest 2023 NEC changes with	✓ Article 630 - Electric Welders
this comprehensive program covering key articles	✓ Article 700 - Emergency Systems
	<ul> <li>Article 702 - Optional Standby Systems</li> </ul>
	✓ Article 706 - Energy Storage Systems
	✓ Article 750 - Energy Management Systems
	✓ Article 800 - General Requirements for
	Communications Systems

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# 2023 NEC Changes Impacting Pools, Hot Tubs, Fountains

Why it's Great	Topics Covered
Expand your knowledge and earn CEUs with this 2023 NEC Changes Impacting Pools, Hot Tubs, and Fountains	✓ Article 680
course. As these installations become more popular, it's critical to understand the changes in Article 680 to	
ensure the safety of your clients. Our course provides a comprehensive overview of the new, expanded, reorganized, clarified, and edited rules in Article 680.	
Our course materials include full-color illustrations, author analysis, technical clarifications, and detailed commentary to help you understand and retain what you learn. You'll come away from this course with a deeper understanding of the NEC's requirements and the ability	
swimming pools, spas, hot tubs, fountains, and similar installations.	

# Top 25 Changes in the 2023 NEC

Why it's Great	Topics Covered
Get up-to-date on the latest changes in the 2023 NEC	✓ Article 110.26 Spaces About Electrical Equipment
with our Top 25 Changes online course. In just two hours,	✓ Article 210.8 Ground-Fault Circuit-Interrupter
you'll learn about important updates to key articles	Protection for Personnel
including GFCI protection, energy management systems,	✓ Article 215.15 Barriers
emergency disconnects, and more. Our expert instructors	✓ Article 220.70 Energy Management Systems
break down the changes with clear explanations, full-	(EMSs)
color illustrations, and practical examples to ensure you	✓ Article 225.41 Emergency Disconnects
understand the new rules and how to apply them.	✓ Article 406.12 Tamper-Resistant Receptacles
Perfect for busy electricians who need to stay current on	✓ Article 410.184 Ground-Fault Circuit-Interrupter
the latest codes and regulations, this course is a quick	(GFCI) Protection and Special Purpose Ground-
and efficient way to stay informed and up to date.	Fault Circuit-Interrupter (SPGFCI) Protection
	✓ Article 440.11 General
	✓ Article 500.4 Documentation
	<ul> <li>Article 511.7 Wiring and Equipment Installed</li> </ul>
	Above Hazardous (Classified) Locations
	<ul> <li>Article 555.4 Location of Service Equipment</li> </ul>
	✓ Article 625.40 Electric Vehicle Branch Circuit
	✓ Article 680.5 Ground-Fault Circuit-Interrupter
	(GFCI) and Special Purpose Ground-Fault Circuit-
	Interrupter (SPGFCI) Protection
	<ul> <li>Article 700.3 Tests and Maintenance</li> </ul>
	<ul> <li>Article 706.7 Commissioning and Maintenance</li> </ul>

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# 2020 NEC

## 2020 NEC Changes Part 1 Art 90-314

Why it's Great	Topics Covered
If your state recently adopted the 2020 NEC and you want to catch up on the changes, this 2020 NEC Changes Part 1 course will help you do just that. With full-color illustrations and practical examples, you'll gain a thorough understanding of the safety requirements and installation tips related to electrical installations covered in Article 90-314. Plus, our author analysis, cautions, and warnings will help you avoid potential conflicts and dangers related to improper electrical installations.	<ul> <li>Article 90-Introduction to the NEC</li> <li>Article 110-Req for Electrical Installations</li> <li>Article 200-Use and Identification of Grounded Conductors</li> <li>Article 210-Branch Circuits</li> <li>Article 215-Feeders</li> <li>Article 220-Branch-Circuit, Feeder, and Service Load Calculations</li> <li>Article 225-Outside Branch Circuits and Feeders</li> <li>Article 230-Services</li> <li>Article 240-Overcurrent Protection</li> <li>Article 250-Grounding and Bonding</li> <li>Article 300-General Requirements for Wiring Methods and Materials</li> <li>Article 310-Conductors for General Wiring</li> <li>Article 312-Cabinets</li> </ul>
2020 NEC Changes Part 2 Art 400-805	
Why it's Great	Topics Covered
staying ahead of the curve and want to catch up on the changes to special requirements and communication systems, this 2020 NEC Changes Part 2 course is a great course for you. Our full-color illustrations will help you visualize practical applications of the new requirements, while author commentary, cautionary notes, installation tips, and safety warnings ensure you understand the changes and how they impact your work. Whether you're an electrician, inspector, engineer, or other professional in the field, this course will help you stay compliant with the 2020 NEC standards.	<ul> <li>Article 400-riexible cords and riexible cables</li> <li>Article 404-Switches</li> <li>Article 406-Receptacles and Attachment Plugs</li> <li>Article 408-Switchboards and Panelboards</li> <li>Article 410-Luminaires, Lampholders, and Lamps</li> <li>Article 422-Appliances</li> <li>Article 424-Fixed Electric Space-Heating Equip</li> <li>Article 440-Air-Condit and Refrigeration Equip</li> <li>Article 445-Generators</li> <li>Article 450-Transformers</li> <li>Article 517-Health Care Facilities</li> <li>Article 555-Marinas, Boatyards, Commercial and Noncommercial Docking Facilities</li> <li>Article 600-Electric Signs and Outline Lighting</li> <li>Article 625-Electric Vehicle Power Transfer Sys</li> <li>Article 680-Swimming Pools, Spas, Hot Tubs, Fountains, and Similar Installations</li> <li>Article 700-Emergency Systems</li> <li>Article 702-Optional Standby Systems</li> <li>Article 800-Gen Req for Communications Systems</li> </ul>

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# Overview of the 2020 NEC Changes

Why it's Great	Topics Covered
This best-selling course will review the significant	✓ Article 110-Requirements for Electrical
changes in Articles 110-700 of the 2020 NEC <sup>®</sup> . With Mike	Installations
Holt's expert analysis and technical clarifications, you'll	✓ Article 210-Branch Circuits
gain a clear understanding of the updated Code rules and	✓ Article 230-Services
their practical applications. Plus, full-color illustrations	✓ Article 250-Grounding and Bonding
and real-world scenarios reinforce what you've learned	✓ Article 300-General Requirements for Wiring
to help you retain the information and apply in everyday	Methods and Materials
installations. Enroll now to ensure compliance with the	✓ Article 406-Receptacles and Attachment Plugs
latest electrical safety standards.	✓ Article 410-Luminaires, Lampholders, and Lamps
	✓ Article 422-Appliances
	✓ Article 555-Marinas, Boatyards, Commercial and
	Noncommercial Docking Facilities
	✓ Article 590-Temporary Installations
	✓ Article 600-Electric Signs and Outline Lighting
	✓ Article 625-Electric Vehicle Power Transfer
	System
	<ul> <li>✓ Article 680-Swimming Pools, Spas, Hot Tubs,</li> </ul>
	Fountains, and Similar Installations
	✓ Article 695-Fire Pumps
	<ul> <li>Article 700-Emergency Systems</li> </ul>

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# Code Related

# 2023 NEC

# 2023 Bonding and Grounding Review

Why it's Great	Topics Covered
This program covers 2023 NEC, Article 250 Bonding and	✓ Article 90-Introduction to the NEC
Grounding in-depth, along with other related Code rules	<ul> <li>Article 110 - Requirements for Electrical</li> </ul>
from the NEC <sup>®</sup> . Often misunderstood, Bonding and	Installations
Grounding is the most critical article in the NEC <sup>®</sup> since	✓ Article 215 - Feeders
poor application of these rules leads to electrical shocks,	<ul> <li>Article 250 - Wiring and Protection</li> </ul>
power quality issues, and other hazards.	✓ Article 300 - General Requirements for Wiring
This course is designed to clear up misconceptions about	Methods and Materials
bonding versus grounding and provide an in-depth	<ul> <li>✓ Article 314—Boxes, Conduit Bodies, and</li> </ul>
breakdown of each Code article that deals with this topic.	Handhole Enclosures
Mike Holt's expertise in explaining these rules and their	<ul> <li>✓ Article 320—Armored Cable (Type AC)</li> </ul>
practical application in real-world scenarios will ensure	<ul> <li>✓ Article 330—Metal-Clad Cable (Type MC)</li> </ul>
you understand the "why" behind these rules, and know	<ul> <li>✓ Article 334—Nonmetallic-Sheathed Cable (Type</li> </ul>
how to apply the NEC effectively every day.	NM)
Understand the rules through full-color illustrations to	✓ Article 340—Underground Feeder and Branch-
help you visualize the code and safety requirements in	Circuit Cable (Type UF)
practical use. You'll also benefit from author analysis,	✓ Article 342—Intermediate Metal Conduit (IMC)
cautionary advice on potential conflicts and confusing	✓ Article 344—Rigid Metal Conduit (RMC)
NEC requirements, installation tips, and warnings of	✓ Article 348—Flexible Metal Conduit (FMC)
hazards associated with improper electrical installations.	✓ Article 350—Liquidtight Flexible Metal
	<ul> <li>✓ Article 352—Rigid Polyvinyl Chloride Conduit (PVC)</li> </ul>
	<ul> <li>✓ Article 356—Liquidtight Flexible Nonmetallic</li> <li>Conduit (LENC)</li> </ul>
	Article 258 — Electrical Motallic Tubing (EMT)
	<ul> <li>Article 358—Electrical Monmotallic Tubing (EMT)</li> <li>Article 262—Electrical Monmotallic Tubing (EMT)</li> </ul>
	$\checkmark$ Article 376—Metal Wireways
	<ul> <li>Article 370—Intelativiteways</li> <li>Article 386—Surface Metal Paceways</li> </ul>
	$\checkmark$ Article 302—Cable Trave
	$\checkmark$ Article 352 – Cable Hays
	$\checkmark$ Article 404—Switches $\checkmark$ Article 406—Recentacles Attachment Plugs and
	Flanged Inlets
	✓ Article 408—Switchboards and Panelboards
	<ul> <li>✓ Article 410—Luminaires</li> </ul>
	✓ Article 440—Air-Conditioning Equipment
	✓ Article 450—Transformers
	✓ Article 600—Electric Signs
	<ul> <li>✓ Article 680—Swimming Pools, Spas, Hot Tubs,</li> </ul>
	Fountains, and Similar Installations

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# 2023 Field Applications for Bonding and Grounding

Why it's Great	Topics Covered
This program covers the rules and applications for Bonding and Grounding as they apply to various NEC articles used in the field. Mike Holt's expertise in explaining these rules and their practical application in real-world scenarios will ensure you understand the "why" behind these rules, and know how to apply the NEC effectively every day. Understand the rules through full-color illustrations to help you visualize the code and safety requirements in practical use. You'll also benefit from author analysis, cautionary advice on potential conflicts and confusing NEC requirements, installation tips, and warnings of hazards associated with improper electrical installations.	<ul> <li>Article 300 - General Requirements for Wiring Methods and Materials</li> <li>Article 314—Boxes, Conduit Bodies, and Handhole Enclosures</li> <li>Article 320—Armored Cable (Type AC)</li> <li>Article 330—Metal-Clad Cable (Type MC)</li> <li>Article 334—Nonmetallic-Sheathed Cable (Type NM)</li> <li>Article 340—Underground Feeder and Branch- Circuit Cable (Type UF)</li> <li>Article 342—Intermediate Metal Conduit (IMC)</li> <li>Article 344—Rigid Metal Conduit (RMC)</li> <li>Article 344—Rigid Metal Conduit (FMC)</li> <li>Article 354—Flexible Metal Conduit (FMC)</li> <li>Article 350—Liquidtight Flexible Metal</li> <li>Article 352—Rigid Polyvinyl Chloride Conduit (PVC)</li> <li>Article 356—Liquidtight Flexible Nonmetallic Conduit (LFNC)</li> <li>Article 356—Electrical Metallic Tubing (EMT)</li> <li>Article 376—Metal Wireways</li> <li>Article 376—Metal Wireways</li> <li>Article 392—Cable Trays</li> <li>Article 404—Switches</li> <li>Article 408—Switchboards and Panelboards</li> <li>Article 410—Luminaires</li> <li>Article 440—Air-Conditioning Equipment</li> <li>Article 450—Transformers</li> <li>Article 680—Swimming Pools, Spas, Hot Tubs, Fountains, and Similar Installations</li> </ul>

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### 2023 General Requirements for Bonding and Grounding

Why it's Great	Topics Covered
This program covers important articles in the 2023NEC that are related to Bonding and Grounding. You'll get an in-depth review of article 250, along with other related Code rules that apply to general applications. Mike Holt's expertise in explaining these rules and their practical application in real-world scenarios will ensure you understand the "why" behind these rules, and know how to apply the NEC effectively every day. Understand the rules through full-color illustrations to help you visualize the code and safety requirements in practical use. You'll also benefit from author analysis, cautionary advice on potential conflicts and confusing NEC requirements, installation tips, and warnings of hazards associated with improper electrical installations	<ul> <li>Article 110 - General Requirements for Electrical Installations</li> <li>Article 215 - Feeders</li> <li>Article 250 - Grounding and Bonding</li> </ul>

### 2023 Understanding Solar PV and Energy Storage Systems

Why it's Great	Topics Covered
With full-color illustrations, detailed commentary, and	✓ Article 90-Introduction to the National Electrical
expert analysis, you'll gain a deep understanding of the	Code
practical applications of solar PV systems and the safety requirements needed for proper electrical installations.	<ul> <li>Article 110 - General Requirements for Electrical Installations</li> </ul>
Our course covers a range of important topics, including	✓ Article 480 - Stationary Standby Batteries
wiring methods, grounding requirements, disconnects,	✓ Article 625 - Electric Vehicle Power Transfer
and much more.	System
	✓ Article 690 - Solar Photovoltaic (PV) Systems
	✓ Article 691 - Large-Scale Photovoltaic (PV) Electric
	Supply Stations
	<ul> <li>Article 702 - Optional Standby Systems</li> </ul>
	✓ Article 705 - Interconnected Electric Power
	Production Sources
	✓ Article 706 - Energy Storage Systems
	✓ Article 710 - Stand-Alone Systems
	<ul> <li>Article 750 - Energy Management Systems</li> </ul>

### 2023 Limited Energy and Communication Systems

Why it's Great

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Learn the essential topics and important NEC Rules for	✓ Article 722 - Cables for Power-Limited Circuits
low-voltage systems with our 2023 Limited Energy	and Fault-Managed Power Circuits
Systems course. Our full-color illustrations will help you	✓ Article 724 - Class 1 Power-Limited Circuits and
visualize practical applications of these requirements,	Class 1 Power-Limited Remote-Control and
while author commentary, cautionary notes, installation	Signaling Circuits
tips, and safety warnings ensure you understand the	✓ Article 725 - Remote-Control, Signaling, and
rules and how they impact your work. Review the NEC	Power-Limited Circuits
rules that apply to low-voltage and limited-energy	✓ Article 760 - Fire Alarm Systems
systems, definitions, general installation requirements,	✓ Article 770 - Optical Fiber Cables
and specific requirements for control, sound, video,	✓ Article 800 - General Requirements for
CATV, CCTV, antennas, telephone, fiber optics, and more.	Communications Circuits

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### 2020 NEC

### 2020 Grounding vs Bonding

#### Why it's Great

Transform your electrical knowledge with Mike Holt's comprehensive online course on Bonding and Grounding. This program covers Article 250 Grounding and Bonding in-depth, along with other related Code rules from the NEC<sup>®</sup>. Often misunderstood, Bonding and Grounding is the most critical article in the NEC<sup>®</sup> since poor application of these rules leads to electrical shocks, power quality issues, and other hazards.

This course is designed to clear up misconceptions about bonding versus grounding and provide an in-depth breakdown of each Code article that deals with this topic. Mike Holt's expertise in explaining these rules and their practical application in real-world scenarios will ensure you understand the "why" behind these rules, and know how to apply the NEC effectively every day. With this online course, you'll review important articles such as 90, 110, 250, 440, 450, and 517, utilizing full-color illustrations to visualize the code and safety requirements in practical use. You'll also benefit from author analysis, cautionary advice on potential conflicts and confusing NEC requirements, installation tips, and warnings of hazards associated with improper electrical installations.

#### **Topics Covered**

- ✓ Article 90-Introduction to the NEC
- Article 110 Requirements for Electrical Installations
- ✓ Article 250 Wiring and Protection
- ✓ Article 440- Air-Conditioning and Refrigeration Equipment
- ✓ Article 450- Transformers
- Article 517 Health Care Facilities

### 2020 NEC Requirements for Solar PV Systems

Why it's Great	Topics Covered
Looking to expand your knowledge of Solar PV Systems and their electrical systems? Our online course is designed to thoroughly review Article 690 as well as other important related NEC Articles from 90-820, in the 2020 NEC.	<ul> <li>✓ Article 90-Introduction to the National Electrical Code</li> <li>✓ Article 110 - Requirements for Electrical Installations</li> <li>✓ Article 480 - Storage Batteries</li> </ul>
With full-color illustrations, detailed commentary, and expert analysis, you'll gain a deep understanding of the practical applications of solar PV systems and the safety requirements needed for proper electrical installations. Our course covers a range of important topics, including wiring methods, grounding requirements, disconnects, and much more.	<ul> <li>Article 690 - Solar Photovoltaic (PV) Systems</li> <li>Article 691 - Large-Scale Photovoltaic (PV) Electric Supply Stations</li> <li>Article 705 - Interconnected Electric Power Production Sources</li> <li>Article 706 - Energy Storage Systems</li> <li>Article 710 - Stand-Alone Systems</li> </ul>

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## 2020 Limited Energy and Communication Systems

Why it's Great	Topics Covered
Learn the essential topics and important NEC Rules for	✓ Article 90 - Introduction
low-voltage systems with our 2020 Limited Energy and	✓ Article 110 - Requirements for Electrical
Communication Systems course. Our full-color	✓ Article 725 - Remote-Control, Signaling, and
illustrations will help you visualize practical applications	Power-Limited Circuits
of these requirements, while author commentary,	✓ Article 760 - Fire Alarm Systems
cautionary notes, installation tips, and safety warnings	✓ Article 770 - Optical Fiber Cables and Raceways
ensure you understand the rules and how they impact	<ul> <li>Article 800 - Communications Circuits</li> </ul>
your work. Review the NEC rules that apply to low-	<ul> <li>Article 810 - Radio and Television Satellite</li> </ul>
voltage and limited-energy systems, definitions, general	Equipment
installation requirements, and specific NEC requirements	<ul> <li>Article 820 - Community Antenna Television and</li> </ul>
for control, sound, video, CATV, CCTV, antennas,	Radio Distribution Systems (Coaxial Cable)
telephone, fiber optics, and more.	

## 2020 Wiring Methods and Materials

Why it's Great	Topics Covered
Why it's Great Upgrade your knowledge of electrical wiring with our comprehensive online course on Wiring Methods and Materials. Designed for electricians, this course covers essential topics including conductor properties, insulation, ampacity, overcurrent protection, raceways, enclosures, and more. Our course materials include full- color illustrations, author analysis, technical clarifications, and detailed commentary to help you understand and retain what you learn. You'll come away from this course with a better understanding of how the rules impact wiring installations how to apply them effectively and safely.	<ul> <li><b>Topics Covered</b> <ul> <li>Article 90 – Introduction to the NEC</li> <li>Article 100 - Definitions</li> <li>Article 110- Requirements for Electrical installations</li> <li>Article 310 – Conductors for General Wiring</li> <li>Article 312 – Cabinet</li> <li>Article 320 – Armored Cable (Type AC)</li> <li>Article 330 – Metal-Clad Cable (Type MC)</li> <li>Article 334 – Nonmetallic-Sheathed Cable (Type NM)</li> <li>Article 336 – Power and Control Tray Cable (Type TC)</li> <li>Article 338 - Service-Entrance Cable (Types SE and USE)</li> <li>Article 340 - Underground Feeder and Branch-Circuit Cable (Type UF)</li> <li>Article 342 – Intermediate Metal Conduit (Type IMC)</li> <li>Article 348 – Flexible Metal Conduit (Type FMC)</li> <li>Article 350 – Liquidtight Flexible Metal Conduit (Type FMC)</li> <li>Article 352 – Rigid Polyvinyl Chloride Conduit (Type PVC)</li> <li>Article 356 – Liquidtight Flexible Nonmetallic Conduit (Type LFNC)</li> <li>Article 358 – Electrical Metallic Tubing (EMT)</li> </ul> </li> </ul>
	<ul> <li>Conduit (Type LFNC)</li> <li>✓ Article 358 – Electrical Metallic Tubing (EMT)</li> <li>✓ Article 362 – Electrical Nonmetallic Tubing (ENT)</li> <li>✓ Article 376 – Metal Wireways</li> <li>✓ Article 380 – Multioutlet Assemblies</li> <li>✓ Article 392 – Cable Trays</li> </ul>
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# **Industry Related**

## Dwelling Unit Calculations (2023 Version)

Why it's Great	Topics Covered
This course focuses on sizing the service load for a	<ul> <li>Part A-Optional Method Load Calculations</li> </ul>
dwelling unit. Sizing the service load for a dwelling unit is	<ul> <li>Part B-Standard Method Load Calculations</li> </ul>
not simply a matter of adding up the individual loads or	<ul> <li>Part C-Neutral Load Calculations</li> </ul>
the rated current for all the breaker sizes. The Code	
recognizes there's load diversity and that not all loads will	
be in use simultaneously. Therefore, it provides various	
"demand factors" which are to be applied to calculate the	
"demand load." The Code provides two different load	
calculation methods-optional and standard; both	
methods are explained in this course.	

### NFPA 70e Electrical Safety Review (2021 edition)

Why it's Great	Topics Covered
This comprehensive online course is designed to provide	<ul> <li>✓ 90.1 - Purpose</li> </ul>
students with a thorough understanding of the NFPA 70E	✓ 90.2 - Scope
Electrical Safety in the Workplace standard, updated in	✓ 90.3 - Standard Arrangement
2021. From appropriate work space clearances to	✓ 90.4 - Mandatory Rules, Permissive Rules, and
personal protective equipment (PPE), the course covers	Explanatory Material
all the rules and guidelines necessary for ensuring safety	✓ 90.5 - Formal Interpretations
when working with electricity. By taking this course,	✓ Article 100 - Definitions
students will gain the knowledge and skills needed to	✓ Article 105 - Application of Safety-Related Work
adhere to the NFPA 70E requirements and keep	Practices and Procedures
themselves and others safe while working with electrical	✓ Article 110 – Electrical Safety-Related Work
equipment.	Practices
	<ul> <li>Article 120 – Establishing and Electrically Safe</li> </ul>
	Work Condition
	✓ Article 130 – Work Involving Electrical Hazards
	✓ Article 205 – General Maintenance Requirements
	<ul> <li>Article 210 - Switchgear, Switchboards,</li> </ul>
	Panelboards, Motor Control Centers, and
	Disconnect Switches
	✓ Article 225 – Fuses and Circuit Breakers
	✓ Article 250 – Personal Safety and Protective
	Equipment

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### **Electrical Theory Review**

Why it's Great	Topics Covered
This interactive online course provides essential general	✓ Electrician's Math
electrical knowledge that every professional in the field	<ul> <li>Basic Electrical Circuits and Formulas</li> </ul>
needs to know. You will gain a comprehensive	✓ Series Circuits
understanding of matter, electron theory, magnetism,	✓ Parallel Circuits
electricity, and electromagnetism. The course also covers	✓ Series-Parallel Circuits
important mathematical concepts and electrical	✓ Multiwire Branch Circuits
formulas, including calculations using voltage, resistance,	<ul> <li>Understanding Alternating Current</li> </ul>
single-phase and multi-phase circuits. By refreshing your	✓ Capacitance
knowledge of these calculations, you will be able to	✓ Induction
perform them more efficiently and safely in your daily	✓ Power Factor
work as an electrician.	✓ Efficiency
	✓ Motor Basics
	1 Transformers

### Theory 1 - Electrical Fundamentals/Basic Electricity

Why it's Great	Topics Covered
Gain a strong foundation in electrical fundamentals with	✓ Matter
this interactive and user-friendly online course. Ideal for	✓ Electron Theory
anyone working with electricity, this course will help you	✓ Magnetism
understand the theory behind electrical systems and the	✓ Electricity
reasons for the rules in the code.	✓ Electromagnetism
	✓ Uses of Electromagnetism
	✓ The Electrical Circuit
	✓ Basic Math
	✓ Electrical Formulas
	✓ Ohm's Law

### Theory 2 - Electrical Circuits, Systems, Protection

Why it's Great	То	pics Covered	
Take your understanding of electrical systems to the next	$\checkmark$	Series Circuits	
level with this interactive and user-friendly online course.	$\checkmark$	Parallel Circuits	
This course will provide you with a comprehensive	$\checkmark$	Series-Parallel Circuits	
understanding of electrical circuits, systems, and	$\checkmark$	Multiwire Circuits	
protections, allowing you to work safely and effectively	$\checkmark$	The Electrical System	
with electrical systems.	$\checkmark$	Protection Devices	
	$\checkmark$	Fuse vs. Circuit Breaker	
	$\checkmark$	Selection and Operation of Circuit Breakers	
	$\checkmark$	Grounding and Ground Fault Protection	

Grounding and Ground Fault Protection



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# Theory 3 - Alternating Current, Motors, Generators, Transformers

Why it's Great	Topics Covered
This interactive and user-friendly online course provides	✓ Alternating Current
a comprehensive overview of alternating current,	✓ Capacitance
motors, generators, and transformers. You will gain a	✓ Induction
solid understanding of the principles behind these	<ul> <li>Power Factor and Efficiency</li> </ul>
important electrical components and their applications.	✓ Motors
	✓ Generators
	✓ Transformers

### Understanding Basic Motor Controls

Topics Covered
✓ Chapter 1- Introduction to Motor Controls
✓ Chapter 2- Motor Control Circuits and Schematics
<ul> <li>Chapter 3- Control Methods and Devices</li> </ul>
<ul> <li>Chapter 4- Reversing Motor Controls</li> </ul>
<ul> <li>Chapter 5- Control of Multiple Motors</li> </ul>
<ul> <li>Annex A- Miscellaneous Requirements</li> </ul>
✓ Annex B- Article 430

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# **Business and Finance**

### **Business Management Part 1**

This comprehensive course covers a wide range of topics, including time management, business forecasting, goal setting, and more. Whether you're a new business owner or an experienced entrepreneur, you'll benefit from the insights and strategies shared in this course. With lessons on marketing, bonding, taxes, insurance, labor units, and labor management, you'll have everything you need to build a thriving, profitable business.

#### **Topics Covered**

- ✓ Time Management
- ✓ Business Forecasting
- ✓ Business Reputation
- ✓ Goal Setting
- ✓ Delegation
- ✓ Marketing
- ✓ Bonding
- ✓ Taxes
- ✓ Insurance
- ✓ Labor Units
- Labor Management

### **Business Management Part 2**

Why it's Great	Topics Covered
Designed to provide a solid foundation in the basics of	✓ Leadership
running a successful electrical contracting business, this	✓ Managements Role
course covers essential topics such as leadership, project	✓ Project Management
management, estimating, budgeting, and much more.	✓ Profit
Whether you're a business owner or employee, you'll	✓ Training
gain valuable insights into managing and growing your	✓ Understanding break even cost
electrical contracting business.	✓ Budgeting
	✓ Billing/invoicing
	✓ Estimating
	✓ Bids
	✓ Proposals
	<ul> <li>Planning and Organizing</li> </ul>
	✓ Job Schedule
	✓ Customers
	✓ Bid Analysis

✓ Plans

**A** 

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## Estimating Fundamentals

Why it's Great	Topics Covered
Learn the fundamentals of estimating and bidding with	✓ Introduction to Estimating Basics
Mike Holt's Estimating Fundamentals course. This	✓ About Estimating
comprehensive online program covers the essential steps	<ul> <li>Understanding Labor Units</li> </ul>
involved in preparing a bid, including calculating material	✓ Unit Pricing
cost, labor hours, break-even cost, and overhead. With	
this course, you'll gain a solid understanding of the	
estimating and bidding process, and learn how to create	
and submit professional bids that will impress your	
customers.	

### Estimating and Bidding

Why it's Great	Topics Covered
In this course, you will learn the important steps involved in preparing a bid, including how to total material costs, determine labor hours, and calculate break-even cost and overhead. Additionally, you will gain knowledge on the bid process and the best practices for creating and	<ul> <li>✓ The Estimating Process</li> <li>✓ Determining Break-Even Cost</li> <li>✓ The Bid Process</li> </ul>
submitting a winning bid. Whether you're new to estimating and bidding or an experienced professional, this course is a valuable resource for improving your skills and growing your business.	

## Estimating – The Basics

Why it's Great	Topics Covered
Every business activity requires a fundamental set of	✓ Introduction to Estimating
skills, and electrical estimating is no different. The	<ul> <li>Qualities of an Estimator</li> </ul>
fundamentals of estimating lay the foundation for	✓ The Estimating Process
understanding the process of creating electrical	
estimates to determine the bid price, how estimates are	
used in the bid process, the responsibilities and resources	
required for estimators, and the critical things you must	
consider to ensure an accurate estimating process.	

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Es	timating – Preparing to Bid the Job		
	Why it's Great	То	pics Covered
	To submit a bid, you must know how much the project	$\checkmark$	The Takeoff
	will cost. To do this, you must prepare an estimate. This	$\checkmark$	Determining Labor Costs
	course reviews the process of creating a quality takeoff	$\checkmark$	Unit Pricing
	used to estimate the cost to complete your scope of	$\checkmark$	Determining Break-Even Cost
	work, the major cost components of the job, including		
	material and labor, using unit pricing as an alternate		
	estimating method to save time, and determining your		
	break-even point		

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23CCOL-CH1-4	2023 NEC Changes CH 1-4	8	8	4	8	10	8	_	8	8	8	12	6		8	10		+	8	8	8	[8]	8	8		0.8	4		8	8	_	8	$\dashv$	12	+	8		8	0.8
23CCOL-CH5-8	2023 NEC Changes CH 5-8	8	8	4	8	10	8		8	8	8	12	6		8	10		_	8	8	8	[8]	8	8	-	0.8	4		8	8		8	4	12	+-	8		8	0.8
23CCOL-ANA	Analysis of the 2023 NEC Changes	16	16	16	16	16	16		16	16	16	16	6		16 [	15] 10	) 15	[15]	16	16	16		16	[15] 16	;	1.6	10	6	16	16	·	16	$\square$	16	15	16		16	1.6
23CCOL-SERV	2023 NEC Changes to Services	16	16		16	16	16		16	16	16	16	6		16	10			16	16	16		16	16	5	1.6	10		16	16		16		16	4	16		16	1.6
23CCOL-ELECT	2023 NEC Changes for Electricians	8	8	8	8	10	8		8	8	8	12	6		8	10	)	_	8	8	8		8	8	_	0.8	4		8	8		8		12	4	8		8	0.8
23CCOL-POOL	2023 NEC Changes for Pools	4	4		4	5	4		4	4	4	4	4		4	5			4	4	4		4	4		0.4	4		4			4		4	4	4		4	0.4
23CCOL-T25	Top 25 Changes	2	2	2	2	2	2	2	2	2	2	2	2		2	2			2	2	2		2	2		0.2	1		2			2		2	4	2		2	0.2
23BGOL	2023 Bonding and Grounding Review	8	8		8	8	8		8	8	8	8	6		8	6* 10			8	8	8		8	8		0.8	8		8	8		8		8		8		8	0.8
23BGOL-GEN	General Requirements for Bonding and Grounding	4	4		4	4	4		4	4	4	4	4		4	6* 5			4	4	4		4	4		0.4	4		4	4		4		4		4		4	0.4
23BGOL-FIELD	Field Applications for Bonding and Grounding	4	4		4	4	4		4	4	4	4	4		4	6* 5			4	4	4		4	4		04	4		4	4		4		4		4		4	04
23501.01	2023 NEC Requirements for Solar PV	8	8			8	8		8	8	8	8	6		8	6* 10			8	8			8				8		8	8		2		8		8		8	0.8
	2023 Limited Energy & communication	4				-											+	+															$\neg$				$\square$		0.0
20LEOL4	systems	4	4			4	4		4	4	4	4	4		4	6* 5	+	+	4	4	4		4	4	+		4		4	4		4	+	4	+	4	$\square$	4	0.4
23CALCOL-U6	Dwelling Unit Calculations	2	2			2	2		2	2	2	2			2	2	+	+		+	2		2	2	+		2		2	_		2	$\rightarrow$	2	+	2		2	0.2
23TXOL2	2023 NEC Texas Complete											_					_	_		-				_	+							+	4		4	4			
23TXOL-24A	2023 NEC Texas Complete- 2024 Version																	_						_	_								4	$\square$	4_	4			
20CCOLP1	2020 NEC Changes Part 1 Art 90-314	8	8		8	10	7		8	8	8	12	6		8	10			8	8	8		8	8	8	0.8	4			8				12	4	8			0.8
20CCOLP2	2020 NEC Changes Part 2 Art 400-805	8	8		8	10	7		8	8	8	12	6		8	10		_	8	8	8		8	8	8	0.8	4			8				12		8			0.8
20CCROL8	Overview of the 2020 NEC Changes		8		8	10	6		10	8	8	12	6		8	10			8	8	8		8	8	8	0.8	4	6		8				12	4	8			0.8
20CCOL4	2020 NEC Changes Review						2			4						2											4							3					
20GBOL	2020 Grounding vs Bonding	8	8		8	10	6			8	8	12	6							8	8		8	8	8	0.8	4			8			$\square$	8		8			0.8
20GBOL4	2020 Grounding vs Bonding 4 hr									4																										4			
	2020 NEC Requirements for Solar PV Systems	8	8			6	6			8	8		6		8					8	8		8	8	8	0.8	4			8				8		8			0.8
201 501	2020 Limited Energy & communication	0				6	6						6													0.0													0.0
20LEOL 20NC3OL	2020 Wiring methods and materials	4	4		4	0	6			4	4		6		4		1		1	4	4		4	4	4	0.8	4			4				4		4			0.4
ETROL	Electrical Theory REV/IEW	8			8					8	8	12								8	8		8	8	8		4					8				8	8	8	
ETOL 1	Theory 1 - Electrical Fundamentals -	0			0					。	。	12				C*		-	1						Ť		-4					-						。	
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ETOL2	Theory 3 - Alternating Current, Motors,	8			8					8	8					6°				8	8		8	8											+	4	8	8	
ETOL3	Generators, Transformers	8			8					8	8					6*	+			8	8		8	8									4		4	4	8	8	
MCMB2OL	Understanding Basic Motor Controls	4					4			4	4	_			+	_	+	+	-	4	4		4	4	4	0.4	4			_		4	4		+-	4	4	4	0.4
70EOL4-21	NFPA 70e Safety 2021				4						4	_				_	+	+		-				_	+	0.4						+	$\square$	4	4	4			0.4
BMOL	Business Management		8											6		6*										0.8									4	4			0.8
BMOL2	Business Management 2		8											6		6*																							
ESTOL1	Estimating Fundamentals		8											6		6*																				4			
ESTOL2	Estimating and Bidding		8											6		6*																			4				
ESTOL-BAS	Estimating—The Basics		6											6																					4	4			
ESTOL-PREP	Estimating—Preparing to Bid the Job		6											6																									
Important Infor	mation																																						
[] = State Specif	c Rules /Laws Required before a certificate	is issu	ed				-		* = Pr	ofessi	onal D	evelop	oment	Credit	Only																								
No Continuing Ed	ucation Requirements in AZ, SC, TN, WV						-		Contir	nuing l	Educat	ion Co	ourses	Not A	oprove	ed in CT	', HI, I	N, IL, I	٨J		-		Live S	eminars	Approv	ed in I/	λ, MN.	Visit	www.r	nikeho	lt.com/	ceuse	emina	r					