

12-Hour 2020 NEC Changes to Chapter 1-4

Instructor: Chuck Price

This course covers the most widely applied codes in the NEC. The definitions and “General Requirements” of Chapter 1 are vital to every code that follows. The class also presents every significant change made to Chapters 2 [Wiring & Protection] and 3 [Wiring Methods & Materials] in the 2020 National Electrical Code® (NEC). These are two critical Chapters, addressing the most central provisions of the NEC for safe and reliable wiring methods, materials, and protective devices that affects almost every kind of electrical installation. The balance of the class presents every significant change made to Chapter 4 [Equipment for General Use]. This Chapter addresses the kind of equipment that is used daily by working electricians. It also contains some of the most rapidly updated provisions of the NEC.

These four Chapters form the “backbone” on the NEC on which all other codes are based.

Each change in this course on Chapters 1 through 4 is presented first with a “thumbnail” to help orient the student and provide a ready means for reviewing the material. The NEC-2020 language for the affected code is then provided, with any deletions and revisions from NEC-2017 clearly shown. Most importantly, each change is accompanied by a thorough-going discussion of what the change means and the reason it was installed in the Code. The discussion includes, where possible, the reasons provided by the relevant code-making panel that oversaw the change and any vital contributions to the discussion from working electricians, manufacturers, and industry analysts. The goal is to express every change in clear language, to focus on how the changes should be applied by a working electrician, and to provide the resources to explore the change more fully for those who wish to do so.

Learning Objectives:

By the end of this course, students will be able to:

- Utilize the new definitions and revised general requirements in their work and in their future use of the NEC;
- Keep up with the latest changes to GFCI and AFCI requirements;
- Apply new approaches on branch circuits;
- Adhere to the latest codes on receptacles, including those on kitchen islands in meeting rooms, and on decks or porches;
- Calculate lighting loads based on new research; the first major change to these calculations since 1971;
- Comply with new Surge Protection and Emergency Disconnect rules;
- Provide for the most effective and reliable grounding and bonding, including where alternative sources of power are involved;
- Become more familiar with some of the newest wiring materials and methods;
- Adopt the most up-to-date rules on Exit Enclosures (Stair Towers);
- Navigate the new organization for Article 310, the new Article on MV Cable, and revised rules on Power Monitoring/Energy Management System

- Apply the new protocols for enclosures for ceiling (paddle) fans and NM Cable;
- Ensure that installations in Cablebus and Cable Trays are done correctly;
- Adopt the most up-to-date methods on switch connections, on service and industrial control panels, and on the latest innovations in lighting control switches;
- Familiarize themselves with some of the newer panelboard and hanging lamp and low-voltage lighting options;
- Apply the latest approaches to electronic protection for motors and transformer;
- Comply with new rules on Emergency Shutdowns for Dwelling Units; Power Sources for Storage Batteries; and Retrofitted Breakers for Higher-Voltage Equipment; and
- Stay current on codes on connections to motors, air conditioning, batteries, and generators.

Syllabus:

Module 1 Changes to Chapter 1

1h 25m 35s

Chapter 1 is comprised of two Articles: Article 100 that covers Definitions and Article 110 that provides the general requirements for electrical installations. These are two core Articles that affect every phase of electrical work.

Thirteen new or revised definitions are covered, including “Equipotential Plane”, “Free Air”, “Grounded Conductor”, “Island Mode”, and “Reconditioned”.

The significant changes to four general requirements complete the class, including changes to 110.12 Mechanical Execution of Work, 110.14 Terminal Connection Torque, 110.22 Identification of Disconnecting Means, and Spaces About Electrical Equipment

Introductory Video to Chapter 2 Wiring & Protection

2m 30s

Module 2 Articles 200 through 210

1h 29m 46s

This module covers 18 changes to the 2020 NEC, including GFCI for Basements & Indoor Damp/Wet Locations, for Specific Appliances & Equipment, and for Outdoor Outlets, Branch Circuit Requirements for Dwelling Unit Bathrooms & Garages, AFCI in Nursing Homes and After Modifications, and Receptacles for Peninsular Countertops, Meeting Rooms, and Balconies, Decks & Porches.

Module 3 Articles 215 through 230

1h 23m 45s

The third module presents 12 changes, including GFCI Protection for Feeders and for Temporary Feeders, Changes to Lighting Loads Calculations, Surge Protection Devices in Dwelling Units, Maximum Disconnects in a Single Enclosure, and Emergency Disconnects at a Readily Accessible Location

Module 4 Articles 240, 242, and 250

1h 29m 55s

The fourth module addresses some of the most misunderstood and most often violated codes in the NEC: those regarding grounding and bonding. It covers 15 changes, including Overcurrent Protection, a new Article on Overvoltage Protection, Grounding Systems Permitted to Be Connected on the Supply Side of the Disconnect, GEC Connections to Rebar, Metal Enclosures to Connect Bonding Jumpers or EGCs, Restricted Use of Metal Frames as EGCs, and an Exception to Resizing EGCs.

Introductory Video to Chapter 3 Wiring Methods & Materials

2m 30s

Module 6 Articles 300 through 311

53m 17s

This module presents 10 significant changes, including Protection Against Physical Damage with Alternative Metal Fittings; Boxes, Conduit Bodies or Fittings Required; Stair Towers; Reorganization of Article 310; Ampacity Tables; and a new Article 311 on Medium Voltage Cable.

Module 7 Articles 312 through 392

1h 29m 2s

This wide-ranging module covers 19 changes, including Power Monitoring or Energy Management Equipment in Enclosures; Volume Allowance for EGCs and Equipment Bonding Jumpers; Outlet Boxes for Ceiling Fans; Type MC Cable in Hazardous Locations; Measuring Type NM Cable from the Enclosure; a new Article on Type P Cable; Conductor Size and Termination in Cablebus; and Limitations of Single Conductor Applications in Cable Tray Systems.

Introductory Video to Chapter 4 Equipment for General Use

1m 18s

Module 8 Articles 400 through 406

1h 22m 11s

This look at Chapter 4 begins with 12 changes, including a New Type of Fixture Wire - FFHH-2, Rating and Use of General-Use Snap Switches Dimmers and Control Switches, Electronic Control Switches, Installation Requirements of Controlled Receptacles, Tamper-Resistant Receptacles, and Single-Pole Separable Connectors.

Module 9 Articles 408 & 410

1h 8m 59s

Module 9 examines 11 changes, including new Panelboard Circuit Directory Locations, Methods of Grounding Luminaires; and Identification of Control Conductor Insulation for Luminaires

Module 10 Articles 422 through 490

1h 18m 49s

This final module discusses 14 changes, including GFCI for Appliances; Electronically Protected Motor Circuits and Controllers; Emergency Shutdown in One- and Two-Family Dwelling Units; Transformers and Transformer Vaults; Identification of Power Sources for Storage Batteries; and Retrofit Trip Units for Equipment Over 1000 Volts Nominal.

Assessment:

Student's fulfillment of the learning objectives is evaluated through the review questions. Students must answer each the questions correctly in order to proceed to the next lesson in the class. The purpose of the questions is both to confirm the student's active participation in the class and to involve the licensee by giving them an opportunity to use the information just presented in the previous section as a useful learning tool.

Course Details:

Requirements:

Our system is offered online and so there are a few requirements in order to complete our course. Our course can be taken with a minimal system that meets all of the requirements, but the learning experience will be best if the system meets the recommendations.

Required: Internet capable device. Our course is compatible with smartphones, tablets, and traditional computers. It is not necessary that students own this device, merely that they have access to such a device.

Required: Internet connection.

Recommended: High-speed internet connection. Our course uses a number of videos and therefore the experience will be better with a high-speed connection.

Required: Up-to-date browser.

Recommended: Up-to-date version of Google Chrome.

Course Setup:

Course completion is tracked through questions between the sections. In order to mark the course as complete students will need to answer all of the questions attached to the course.

Upon enrolling in our course students will have access for 365 days. After this 365-day period, they may contact us to have their enrollment renewed. Any questions, concerns, or issues that arise while taking the class can be addressed by calling the contact number, writing to the contact e-mail, or sending a message through the "Suggestion Box" included in the course. Any message will receive a response within one business day, and usually within one hour.

After finishing all course content, the student will need to fill out the "Completion Questionnaire" so that their completion can be reported to the state.

Continuing Education Credit Criteria:

Each portion of this course is only accessible once the student has satisfactorily completed the course content of the previous portion, including the review questions. Upon successful completion of the course content and any and all review questions, the student completes a "Mandatory Questionnaire" which provides us with the information we need to report completion to the state. The student will then have access to the certificate of completion, which is solely for the student's own records.

Refunds:

All tuition and fees paid by the applicant shall be refunded if the applicant is rejected by the school before enrolment. All tuition and fees paid by the applicant shall be refunded if requested within three business days after the terms and conditions have been accepted (on the enrollment page). All refunds will be returned within thirty business days. After the initial three business days have elapsed, AYPO will happily refund 100% of the purchase price for any course which the student has not yet begun.

Refunds of all or some portion of the purchase price may be available in situations where the student has already started taking the course, but not yet completed it. In general, for individuals who have already completed an entire course, refunds will not be available. Our office staff may be reached at (877) 724-6150 for more information about refund requests.

Attendance and Dismissal:

Students who enroll in this class are required to complete 100% of the course to receive credit. Since this class is presented online, enrolled students are not dismissed.

Course Content:

At Your Pace Online is responsible for the content of this course.