



## Course Description, Performance Objectives and Outline Analysis of Changes 2020 NEC - Part 2 - Chapters 3 and 4

### Course Description

Welcome to the course “Analysis of Changes 2017 NEC - Part 2 Chapters 3 and 4”. The instructor for this course is Keith Lofland, Director of Education at the International Association of Electrical Inspectors (IAEI).

This online course is an extensive and popular program analyzing the major changes to the National Electric Code (NFPA 70™) for the 2020 cycle. Members of the eighteen NEC® code-making panels contributed to the development of the authoritative text used in this online course.

The course covers more than 70 of the most significant code changes in Chapters 3 and 4. Specifically, the course covers code changes related to wiring methods and equipment for general use.

### Performance Learning Objectives

Upon successful completion of this course participants will be able to:

- Describe changes to wiring methods and conductors for general wiring.
- Define changes regarding proper use of medium voltage cable, boxes, and different cable types.
- State changes to the use and identification of cablebuses, multioutlet assemblies and cable trays.
- Understand changes regarding flexible cords and cables, switches, receptacles, switchboards and luminaires.
- Explain changes in heating equipment, motors, air conditioning and refrigeration equipment, generators, transformers and storage batteries.

### Timed Course Outline - 4 Online CE Hours

*Note: Timing based on actual audio running time, analysis of change text @ 500 words per minute, quiz questions @ 30 seconds each and final exam questions @ 1 minute each. No seat time allotted for Summary of Change tab.*

## I. Introduction and Copyright

(0 minutes used in seat time calculation)

- Welcome to IAEL and Pace - NFPA, NEC Copyright Information 2020
- Course Orientation
- Performance Learning Objectives
- Course Syllabus
- Course Interface Instruction
- Ask the instructor

## II. Article 300

(18 minutes)

- 300.4(G) Alternative Metal Fittings: Protection Against Physical Damage
- 300.7(A) Sealings in Raceways Exposed to Different Temperatures
- 300.15(F) Boxes, Conduit Bodies, or Fittings- Where Required
- 300.22(D) Air-handling Areas Beneath Raised Floors for IT Rooms
- 300.25 Exit Enclosures (Stair Towers)
- 300.45 Replacing the word "Warning" with "Danger" Signs
- Article 300 Quiz

## III. Articles 310 – 320

(39 minutes)

- Article 310 Conductors for General Wiring
- Article 310 Ampacity Tables
- Article 310 Ampacity for Conductors
- 310.10 Uses Permitted of XHHN, XHWN, and XHWN-2
- 310.12 and Table 310.12 Dwelling Unit Service and Main Power Feeder Conductors
- Article 311 Medium Voltage Cable
- 312.8(B) Energy Management Equipment
- 314.16(B)(5) Volume Allowance for EGCs and Equipment Bonding Jumpers
- 314.27(C) Outlet Boxes for Support of Ceiling-Suspended (Paddle) Fan
- 320.80(A) Adjustment Factors of Type AC Cable
- Articles 310 - 320 Quiz

## IV. Articles 330 – 344

(25 minutes)

- 330.130 Type MC Cable "MC-HL" in Hazardous (Classified) Locations
- 334.2 Deletion of References to Type NMS Cable
- 334.30 Measuring Type NM Cable from the Enclosure
- Article 337 New Article Covering Type P Cable
- 338.2 Service-Entrance Conductor Assembly
- 338.100 Assemblies, Construction, and Uninsulated SE Conductors
- 342.10(E) Intermediate Metal Conduit (Type IMC)

- 342.14 Type IMC with Dissimilar Metals
- 344.10(A) Uses Permitted of Red Brass RMC
- Articles 330 - 344 Quiz

V. Article 350 – 392

(24 minutes)

- 350.10(4) Permitted Uses for LFMC
- 370.20 Conductor Sizing and Terminations for Cablebus
- 374.6 Listed Cellular Metal Floor Raceways
- 380.12(7) Uses Not Permitted for Multioutlet Assembly
- 382.104(C) Equipment Grounding Conductor for Concealable Nonmetallic Extensions
- 392.10 Limitations of Single Conductor Applications in Cable Tray Systems
- 392.30(B)(4) Securing and Supporting (Cable Trays)
- 392.44 Expansion Splice Plates
- 392.46 Bushed Conduit and Tubing. (Cable Trays)
- Articles 350 - 392 Quiz

VI. Articles 400 – 404

(21 minutes)

- 400.12 Uses Not Permitted, Flexible Cords, flexible cables, cord sets, power supply cords
- Table 402.3 New Type of Fixture Wire – FFHH-2
- 404.7 Visibility Requirements for Switches and Circuit Breakers
- 404.9 General-Use Snap Switches, Dimmers, and Control Switches
- 404.14 Rating and Use of Switches
- 404.22 Electronic Control Switches
- Articles 400 - 404 Quiz

VII. Articles 406 – 408

(49 minutes)

- 406.4(D)(4), Ex. No. 1 General Installation Requirements (Receptacles)
- 406.4(D)(7) Installation Requirements of Controlled Receptacles
- 406.5(G)(2) Receptacle Mounting Under Sinks
- 406.9(C) Receptacle Limitations in Bathrooms
- 406.12 Tamper-Resistant Receptacles
- 406.13 Single-Pole Separable-Connector Type
- 408.4(A) Approved Locations for Circuit Directory for a Panelboard
- 408.6 Short-Circuit Current Ratings of Switchboards, Switchgear, and Panelboards
- 408.8 Reconditioning of Equipment. (Switchboards, Switchgear, and Panelboards)
- 408.18(C) Clearances for Switchboards, Switchgear, and Panelboards)
- 408.36, Ex. No. 1 Overcurrent Protection in Panelboards
- 408.43 Panelboard Orientation
- Articles 406 - 408 Quiz

VIII. Article 410

(25 minutes)

- 410.2 and 410.16 Clothes Closet Storage Space
- 410.36(A) Means of Support for Luminaires Supported by Outlet Boxes
- 410.44 Methods of Grounding. (Luminaires, Lampholders, and Lamps)
- 410.69 Identification of Control Conductor Insulation
- 410.116(C) Recessed Luminaires Installed in Fire-Resistance Construction
- 410.118 Luminaire Access to Other Boxes
- Article 410, Part XVI Horticultural Lighting Equipment
- Article 410 Quiz

IX. Articles 422 - 430

(27 minutes)

- 422.5(A) GFCI Requirements for Appliances
- 422.16(B)(2) Flexible Cords Requirements for Built-in Dishwashers and Trash Compactors
- 422.16(B)(4) Flexible Cords and Microwave Oven/Range Hood Combinations
- 424.20(A) Thermostatically Controlled Switching Devices, Combination Thermostats, Manually Controlled Switches for Fixed Electric Space-Heating Equipment
- 425.22(B) Resistance-Type Heating Elements in Fixed Industrial Process Heating Equipment
- 430.2 Electronically Protected (Motors)
- 430.122(B) Adjustable-Speed Drive Motors
- 430.122(D) Adjustable-Speed Drive Motors
- Articles 422 - 430 Quiz

X. Articles 440 – 490

(19 minutes)

- 440.9 Grounding and Bonding HACR Equipment
- 440.32 Branch-Circuit Conductors Supplying a Single Motor-Compressor
- 445.6 Listing of Stationary Generators of 600 Volts and Less
- 445.18(D) Emergency Shutdown in One- and Two-Family Dwelling Units
- 450.9 Horizontal Top Surfaces of Transformers Prohibited as a Storage Area
- 480.7(G) Directory and Identification of Power Sources for Storage Batteries
- 490.21(A)(5) Retrofit Trip Units with Circuit-Interrupting Devices
- Articles 440 - 490 Quiz

**Total Seat Time: 247 minutes**

*Utah Electrician (DOPL)*  
*Continuing Education Course Completion Certificate*

***David Arnold***

License Number: 123456

*This certifies that the individual named has successfully  
completed the course requirements for:*

*Analysis of Changes 2020 NEC - Part 2 - Chapters 3 and 4*

Course Approval Number: xxxxx

*which was completed on 4/21/2022  
and has earned 4.00 continuing education hours.*

*Online course provided by:*

**The Media Factory, Inc. (d/b/a PacePDH.com)**

Tampa, FL 33609

(813) 830-6523

Instructor Name: Jody Wages



[www.pacepdh.com](http://www.pacepdh.com)

A handwritten signature in black ink, appearing to read "Ron May".

*Ron May, Vice President*



# Course Syllabus

## **Sponsor / Facilitator Information**

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## **Instructor / Code Change Content Expert**

Jody Wages, Director of Digital Education  
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## **Assignments and Homework:**

This is an online course. All course work is contained within the course itself. There are no additional assignments or homework outside the course itself.

## **Broadcast Schedules:**

All portions of this course may be taken at any time 24/7, at the student's discretion.

## **Student Material Requirements:**

This course requires an Internet connection. While the course will play using a slower connection, a higher speed connection (e.g. DSL or cable modem) is recommended because of the extensive use of audio in the course. The course also can be played on a tablet or smart phone.

## **Testing and Grading Information:**

The course includes quizzes throughout the course, typically about every half hour. The

passing score for the quizzes is 70%. The *NEC*® 2020 code book may be used as a reference during testing.

### **Library and Resource Information:**

Strikethrough code language, showing previous 2017 code language that has been changed or deleted in the 2020 *NEC*, is available in the Summary of Change tab at the end of each code change slide.

### **Deadlines:**

There are no deadlines imposed by PacePDH.com and our courses do not expire. However, to receive credit, the course should be completed before the Board/jurisdiction course approval date expires. The system will not allow you to launch a course that is expired. Obviously, you should try to complete the course before your individual license renewal period ends.

### **Registration Period:**

You may register for this course at any time.

### **Fees and Refunds:**

PacePDH.com typically receives course tuition payments in advance via student credit or debit card payments through its secure online Web portal. Checks are also accepted; in which case courses are assigned once the check is received. For company or group purchases, payment terms may be given.

PacePDH.com's refund policy is simple, a full cash refund is offered for up to 90 days or until the course has been completed, whichever comes first. After the 90 day period courses that have not been completed can be converted into course credits for other Pace offerings. For example, if a student has completed one hour of a four-hour online course and then decides they do not want to complete the course, a full refund is still offered if it is within 90 days of the purchase date, otherwise a course credit is offered. Once the online course has been completed, as determined by our LMS (learning management system), a refund is no longer offered.

### **ADA Information:**

This course is not compliant with Section 508 of the U.S. Rehabilitation Act.

### **Technology Support Services:**

Tech support for students is available Monday through Friday 8AM to 6PM eastern time. Afterhours and weekend support is offered at times. Support is available by phone at

(800) 576-4341, via Web form at <http://www.pacepdh.com/index.cfm?fuseaction=custom.contact> or via e-mail at [PaceSupport@PacePDH.com](mailto:PaceSupport@PacePDH.com) .

**Completion and Assignment Time Lines:**

See “Deadlines” above.

**Prior Learning Assessments / Prerequisites:**

There are no prerequisites for this course. Course interface/navigation instructions, “Ask the Instructor” and directions on how to take personal course notes are provided at the beginning of the course.