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Changes to the 2020 National Electrical Code with NFPA 70E

Course Syllabus and Outline

Course Details:

Core Hours: 16

Course Type: 12 hours 2020 NEC Code Update and 4 hours NFPA 70E Safety Training

Textbook: 2020 NEC Code Book and NFPA 70E Hand Book

Class Format and Location: Taken Online @ www.MyElectricalCeu.com

Instructor: Charles Clemens (previously approved)

Course Outline / Description:

This course covers 300 (12 hours) of the most significant changes to the 2020 NEC starting with Article 90, and working through Article Chapter 9. This course also Covers 75 topics (4 hours) on Electrical Safety in the Workplace as outlined in NFPA 70E.

Chapter 1 General: .5 hours

90 Introduction

100 Definitions

110 Requirements for Electrical Installations

Chapter 2 Wiring and Protection: 1 hours

200 Use and Identification of Grounded Conductors

210 Branch Circuits

215 Feeders

220 Branch-Circuit, Feeder, and Service Load Calculations

225 Outside Branch Circuits and Feeders

230 Services

240 Overcurrent Protection

242 Overvoltage Protection

250 Grounding and Bonding

Chapter 3 Wiring Methods and Materials: 3 hours

300 General Requirements for Wiring Methods and Materials

310 Conductors for General Wiring

311 Medium Voltage Conductors and Cable

312 Cabinets, Cutout Boxes, and Meter Socket Enclosures

314 Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Handhole Enclosures

320 Armored Cable: Type AC

322 Flat Cable Assemblies: Type FC

324 Flat Conductor Cable: Type FCC

326 Integrated Gas Spacer Cable: Type IGS

330 Metal-Clad Cable: Type MC

332 Mineral-Insulated, Metal-Sheathed Cable: Type MI
334 Nonmetallic-Sheathed Cable: Types NM and NMC
336 Power and Control Tray Cable: Type TC
337 Type P Cable
338 Service-Entrance Cable: Types SE and USE
340 Underground Feeder and Branch-Circuit Cable: Type UF
342 Intermediate Metal Conduit: Type IMC
344 Rigid Metal Conduit: Type RMC
348 Flexible Metal Conduit: Type FMC
350 Liquidtight Flexible Metal Conduit: Type LFMC
352 Rigid Polyvinyl Chloride Conduit: Type PVC
353 High Density Polyethylene Conduit: Type HDPE Conduit
354 Nonmetallic Underground Conduit with Conductors: Type NUCC
355 Reinforced Thermosetting Resin Conduit: Type RTRC
356 Liquidtight Flexible Nonmetallic Conduit: Type LFNC
358 Electrical Metallic Tubing: Type EMT
360 Flexible Metallic Tubing: Type FMT
362 Electrical Nonmetallic Tubing: Type ENT
366 Auxiliary Gutters
368 Busways
370 Cablebus
372 Cellular Concrete Floor Raceways
374 Cellular Metal Floor Raceways
376 Metal Wireways
378 Nonmetallic Wireways
380 Multioutlet Assembly
382 Nonmetallic Extensions
384 Strut-Type Channel Raceway
386 Surface Metal Raceways
388 Surface Nonmetallic Raceways
390 Underfloor Raceways
392 Cable Trays
393 Low-Voltage Suspended Ceiling Power Distribution Systems
394 Concealed Knob-and-Tube Wiring
396 Messenger-Supported Wiring
398 Open Wiring on Insulators
399 Outdoor Overhead Conductors over 1000 Volts

Chapter 4 Equipment for General Use: 2.5 hours

400 Flexible Cords and Flexible Cables
402 Fixture Wires
404 Switches
406 Receptacles, Cord Connectors, and Attachment Plugs (Caps)
408 Switchboards, Switchgear, and Panelboards
409 Industrial Control Panels
410 Luminaires, Lampholders, and Lamps
411 Low-Voltage Lighting
422 Appliances
424 Fixed Electric Space-Heating Equipment
425 Fixed Resistance and Electrode Industrial Process Heating Equipment
426 Fixed Outdoor Electric Deicing and Snow-Melting Equipment
427 Fixed Electric Heating Equipment for Pipelines and Vessels

- 430 Motors, Motor Circuits, and Controllers
- 440 Air-Conditioning and Refrigerating Equipment
- 445 Generators
- 450 Transformers and Transformer Vaults (Including Secondary Ties)
- 455 Phase Converters
- 460 Capacitors
- 470 Resistors and Reactors
- 480 Storage Batteries
- 490 Equipment Over 1000 Volts, Nominal

Chapter 5 Special Occupancies: 2 hours

- 500 Hazardous (Classified) Locations, Classes I, II, and III, Divisions 1 and 2
- 501 Class I Locations
- 502 Class II Locations
- 503 Class III Locations
- 504 Intrinsically Safe Systems
- 505 Zone 0, 1, and 2 Locations
- 506 Zone 20, 21, and 22 Locations for Combustible Dusts or Ignitable Fibers/Flyings
- 510 Hazardous (Classified) Locations — Specific
- 511 Commercial Garages, Repair and Storage
- 513 Aircraft Hangars
- 514 Motor Fuel Dispensing Facilities
- 515 Bulk Storage Plants
- 516 Spray Application, Dipping, Coating, and Printing Processes Using Flammable or Combustible Materials
- 517 Health Care Facilities
- 518 Assembly Occupancies
- 520 Theaters, Audience Areas of Motion Picture and Television Studios, Performance Areas, and Similar Locations
- 522 Control Systems for Permanent Amusement Attractions
- 525 Carnivals, Circuses, Fairs, and Similar Events
- 530 Motion Picture and Television Studios and Similar Locations
- 540 Motion Picture Projection Rooms
- 545 Manufactured Buildings and Relocatable Structures
- 547 Agricultural Buildings
- 550 Mobile Homes, Manufactured Homes, and Mobile Home Parks
- 551 Recreational Vehicles and Recreational Vehicle Parks
- 552 Park Trailers
- 555 Marinas, Boatyards, Floating Buildings, and Commercial and Noncommercial Docking Facilities
- 590 Temporary Installations

Chapter 6 Special Equipment: 1 hours

- 600 Electric Signs and Outline Lighting
- 604 Manufactured Wiring Systems
- 605 Office Furnishings
- 610 Cranes and Hoists
- 620 Elevators, Dumbwaiters, Escalators, Moving Walks, Platform Lifts, and Stairway Chairlifts
- 625 Electric Vehicle Power Transfer System
- 626 Electrified Truck Parking Spaces
- 630 Electric Welders
- 640 Audio Signal Processing, Amplification, and Reproduction Equipment
- 645 Information Technology Equipment

646 Modular Data Centers
647 Sensitive Electronic Equipment
650 Pipe Organs
660 X-Ray Equipment
665 Induction and Dielectric Heating Equipment
668 Electrolytic Cells
669 Electroplating
670 Industrial Machinery
675 Electrically Driven or Controlled Irrigation Machines
680 Swimming Pools, Fountains, and Similar Installations
682 Natural and Artificially Made Bodies of Water
685 Integrated Electrical Systems
690 Solar Photovoltaic (PV) Systems
691 Large-Scale Photovoltaic (PV) Electric Supply Stations
692 Fuel Cell Systems
694 Wind Electric Systems
695 Fire Pumps

Chapter 7 Special Conditions: 1 hours

700 Emergency Systems
701 Legally Required Standby Systems
702 Optional Standby Systems
705 Interconnected Electric Power Production Sources
706 Energy Storage Systems
708 Critical Operations Power Systems (COPS)
710 Stand-Alone Systems
712 Direct Current Microgrids
720 Circuits and Equipment Operating at Less Than 50 Volts
725 Class 1, Class 2, and Class 3 Remote-Control, Signaling, and Power-Limited Circuits
727 Instrumentation Tray Cable: Type ITC
728 Fire-Resistive Cable Systems
750 Energy Management Systems
760 Fire Alarm Systems
770 Optical Fiber Cables

Chapter 8 Communications Systems: .5 hours

800 General Requirements for Communications Systems
805 Communications Circuits
810 Radio and Television Equipment
820 Community Antenna Television and Radio Distribution Systems
830 Network-Powered Broadband Communications Systems
840 Premises-Powered Broadband Communications Systems

Chapter 9 Tables: .5 hours

Informative Annex A Product Safety Standards
Informative Annex B Application Information for Ampacity Calculation
Informative Annex C Conduit, Tubing, and Cable Tray Fill Tables for Conductors and Fixture Wires of the Same Size
Informative Annex D Examples
Informative Annex E Types of Construction
Informative Annex F Availability and Reliability for Critical Operations Power Systems; and Development and Implementation of Functional Performance Tests (FPTs) for Critical Operations

Power Systems

Informative Annex G Supervisory Control and Data Acquisition (SCADA)

Informative Annex H Administration and Enforcement

Informative Annex I Recommended Tightening Torque Tables from UL Standard 486A-486B

Informative Annex J ADA Standards for Accessible Design

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NFPA 70E: 4 hours

Risk Assessment Procedure

Hierarchy of Risk Control Methods

Establishing an Electrically Safe Work Condition

Estimate of the Likelihood of Occurrence of an Arc

Flash Incident

Arc-Rated Clothing using Incident

Energy Analysis Method

Course Objectives:

Identify sections in the 2020 NEC that have been changed and inform on what that change is. Train on electrical safety in the workplace as found in NFPA 70E including lockout / tagout procedures and arc flash awareness.

Course Evaluation:

Each section includes **the 2020 NEC of NFPA 70E code section, commentary, and a multiple choice question**. The student must complete all questions and score a minimum of 75% in order to get credit for the course. The course is also timed, and credit will not be given until the full 16 hours have been completed.

*When the Student starts the course, the software timer begins.

*The Student must remain active throughout the course or the software timer will log them out automatically after 30 minutes of inactivity.

*The Student is required by the software timer to spend a full 8 hours in order to complete the course or receive credit for the course, regardless of what their passing percentage is. The software timer will not allow a course to be completed without achieving the full time allotment.

*The Student will review incorrectly answered questions if He or She finishes before the required time allotment has been achieved. Completed answers can NOT be changed.

*Students are monitored during their time online and their course is reviewed after completion before any credit is received. Any suspicious activity is addressed. No Student will receive credit for a course if found to be deceptive in any way.

