



"Code Made Simple"

DETAILED 2020 NEC® WORKSHOP

Course Syllabus

16 Core, 3 **Professional**

Description

Students will learn about the basic flow and navigation of the National Electrical Code and National Fire Alarm and Signaling Code. Students are “reintroduced” to these references using correct terminology which helps them with effectively navigate and locate the answers to their questions. The instructor helps connect real life situations to these references so that students are more comfortable and familiar with utilizing their NEC and NFPA. Students review various Tables and Articles in detail. Students are expected to have studied on their own before coming to this workshop. They will use this time to reinforce learned concepts with the instructor and ask clarifying questions.

Learning Objectives

- Students will learn correct terminology used in the NEC and NFPA.
- Students will learn the arrangement of the NEC and NFPA in order to locate needed information.
- Students will practice calculations and relate these calculations to the NEC.
- Students will learn how to effectively run a safe electrical business utilizing resources such as NFPA 70E, OSHA, and MSHA.
- Students will review NEC changes and how to incorporate these changes within their day to day jobs.

Registration: 7:30am-8am

Participants are required to sign a state-specific roster(s) and show a government issued picture ID upon entering the workshop. Arriving late or leaving early results in non-reporting of hours. Students are provided a written explanation of attendance and transfer policies at the time of their workshop confirmation.

DAY ONE

Navigating the National Electrical Code: 8-10

Code Formatting

History, Chapters & Articles, Arrangement & Format

Arrangement of Chapters - 1-4, 5-7, 8, 9

Navigation Methods of the Code

The Paralleled Numbering System: 10-12

Commonly Referenced Sections

Article 90 - Administration
Article 100 - Definitions
Article 200 - Neutral vs Grounded Conductor

Basic NFPA Code Requirements: 12-2

Fire department basic requirements - disconnect, etc
Article Point Flow & Format
Remembering Code Articles - 210 to 250
Basic Code Occupancies - Dwelling vs Non-Dwelling
NEC math formulas - percentage math, volume math
Code navigation methods & recommendations
Grounded vs Grounding

Ohm's Law & Review of Electrical Calculations: 2-4

Foundational Review
Code Wide Factors - 125%, Rounding, Derations, etc
100 Amp Rule
Required Considerations - continuous, derated, phase, etc
Single Phase vs Three Phase formula
Wye vs Delta
Article 240

Branch-Circuit, Feeder, & Service Load Calculations: 4-6

Article 220
Standard, Optional, Derations or Demands
General Lighting Loads & Derations, Receptacle Loads & Derations
Non-Dwelling, Optional Dwelling, Multi-family dwelling, Single family dwelling
Show Window Lighting, Track Lighting Loads, Motor Loads, Heating Loads
Dwelling appliance loads & derating
Neutral sizing & Neutral derating
Table 220
Practice

DAY TWO

Conductors for General Wiring: 8-9

Conductor Tables & Ampacities
Multiplying vs Dividing
Article 240 - High Voltage
Tables 311 - Medium Voltage
Practice

Wire Bending Spaces and Box & Conduit Fill: 9-10

Article 312 - Wire Bending Spaces
Pancake boxes & Domed fixtures

Table 314 - Box volume/Fill calculation
Box & Conduit body fill
Counting Conductors
Pull boxes
Practice

Cable Tray Fill, Switches & Wireways: 10-10:30

Article 392 - Cable Tray Fill
Conduit & Tubing Fill
Practice

Fixed Electric Space Heating: 10:30-11

Article 424 - Space Heating Equipment
Branch Circuits 125%
Practice

Motors & Motor Circuits: 11-12

Article 430 - The Six Pack
Motor Ampacities
Motor Branch Circuits
Overload Protection
Overcurrent Protection
Motor Controller
Motor Disconnect
Practice

Additional Equipment: 12-1

Article 440 - A/C Equipment
Article 450 - Transformers
Practice

Bonding & Grounding: 1-2

Article 250
Electrodes Permitted for Grounding
Grounding Electrode Conductor Sizing
Grounding Electrode Conductor for AC Systems
Grounding Conductor, Main Bonding Jumper, System Bonding Jumper, and Supply-Side Bonding Jumper for AC Systems
Minimum Sizing Equipment Grounding Conductors for Grounding Raceway & Equipment

Highlight and Interpret: 2-2:30

Article 90
Article 110
Article 200

Practice

Branch Circuits/Outside Branch Circuits & Feeders: 2:30-4

Article 210

Required Branch Circuits in Dwellings

Intro of continuous loads/continuous duty

Article 215 - Feeders

Article 225

Services & Overcurrent Protection: 4-4:15

Article 230

Article 240

Key Points & Highlights

Practice

Wiring Methods & Materials: 4:15-4:30

Chapter 3

Key Points

Book of Specials: 4:30-5

Chapters 5, 6, & 7

Articles 500-516 - Hazardous Classified Locations

Tables 505 & 506

Article 517 - Healthcare Facilities

Article 550 & 552 - Mobile Homes & Park Trailers

Article 553 & 555 - Floating Buildings & Marinas

Article 590 & 647 - Temporary Power & Sensitive Electronic Equipment

Article 610 - Cranes & Hoists

Article 680 & 695 - Pools & Fire Pumps

Flow & Navigation of the NFPA: 5-5:30

Code Organization & Layout

Arrangement of Code Chapters

Components of Systems, Appliances, & Devices

Interface of Systems & Chapter 21

Alarm system types

Annex and Index

Business Management, Law, and Safety: 5:30-6

Eight basic forms - state license, etc

Elements to a business - delegation, etc

Types of businesses - Sole, S vs C, LLC

Insurance - workmen's comp, etc

Bonds - six types

Estimating - Take off method, etc

Forms & Bookkeeping - Profit & Loss, etc
Permits & Violations - OSHA, etc

Method of Instructional Delivery

Classroom – lecture, discussion of topics, and hand-on problem solving and calculations as discussed

Materials and Instructional Aids

Instructor utilizes a PowerPoint presentation throughout instruction. Workshop participants are provided with a **Detailed NEC Instructional Manual** and a copy of **PowerPoint slides**. Participants bring a **National Electrical Code Book & National Fire Alarm and Signaling Code Book** (Current Editions). It is suggested to bring a notebook, calculator, and a highlighter to class.

Availability of Courses to the General Public

All submitted courses are open to the public for registration and attendance.

Evidence of Completion

Each participant is provided with a Certificate of Completion at the end of class. JCR Productions, Inc. retains original copies of all signed rosters and has electronic copies kept indefinitely.

Costs

\$650.00 - includes workshop and materials

Class Location & Size

Workshops are held monthly at the following locations:

- Hampton Inn, 3920 Arrow Drive, Raleigh, NC 27612 - Class size: ~60
- Springhill Suites, 121 Gateway Blvd, Mooresville, NC 28117 - Class size: ~40
- Comfort Inn, 890 Brevard Rd, Asheville, NC 28806 - Class size: ~40

Instructor

Victor Ring- Code Consultant, JCR Productions, Inc.