

NEC® UPDATES & PRACTICAL APPLICATION IN BUILDINGS & FACILITIES

This course will include information found in the National Electrical Code®, but is not a typical “code” class.

This course starts by covering the major changes of the 2017 National Electrical Code® so you can then examine some of the basic rules in the NEC® and learn to apply them in examples of how the proper size devices or components are selected for an electrical installation through lab exercises.

In this course, you will be taught basic principles of how various electrical systems of a facility are designed. While some electrical projects should employ a qualified engineer, the size and scope of many electrical tasks require your personnel to understand basic rules of component sizing and system arrangement.

This course improves worker safety by providing information about the sources, control, protection and isolation of electrical power – invaluable knowledge in emergency situations.

Whether you design, install, supervise, maintain or simply work with contractors on electrical installations, this course will improve the quality and safety of your next project.



CLASS FORMAT:

Lecture

STANDARD CLASS SIZE:

NTT recommends a class of no more than 35 participants to obtain the best results.

NTT TO PROVIDE:

- Three days (24 contact hours) of on-site instruction
- Textbooks
- Classroom consumables
- Completion certificates
- Course syllabus, outline, table of contents, or training objectives
- Shipping and instructor travel logistics

CLIENT PROVIDES:

- Classroom of 500 square feet or greater
- Projection screen, white board and/or flip chart(s)
- Students are encouraged to bring a copy of the National Electrical Code

WHO SHOULD ATTEND:

- Engineers of all disciplines
- Electricians
- Technicians
- Maintenance Managers
- Building Managers



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Start with an overview of the Code and Changes in this cycle.

Then learn by doing how to properly interpret electrical drawings, construction blueprints and schedules.

You will examine and discuss basic electrical concepts such as voltage drop, conductor fill, short-circuit analysis, kVA ratings, service calculations and grounding and bonding. In the end you will understand:

- Work with building electrical wiring below 600 volts
- Wire 3-way and 4-way lighting switch circuits
- Select conduit and wire according to the NEC®
- Wire generators for automatic transfer operation
- Set an automatic generator to start and stop
- Size overcurrent protection for distribution, panelboards and branch circuits
- Size transformers and their overcurrent protection
- Transformer connections Wye/Delta, Buck/Boost, Control and Isolation
- Grounding and Bonding of services and transformers
- Transformer “tap” rules
- Motor circuit component and wiring: overload, short circuit and ground fault protections
- Basic fire alarm systems and wiring



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COURSE AGENDA

EC17 TOPIC ANALYSIS – MAJOR CHANGES IN CHAPTER 1 THROUGH 4

CHAPTER 1

- 110.14 Electrical Connections has a new subsection regarding mandatory tightening torque requirements
- New Labeling requirements
- New provisions for spaces of “Limited Access”
- 110.41 is a new section on Inspections and Tests

CHAPTER 2

- Article 250 Grounding and Bonding

CHAPTER 3

- 300.5 landscape lighting.
- 314.27(E) is a new subsection
- New provisions in Article 336
- 366.20 parallel conductors

CHAPTER 4

- Markings on controlled receptacles
- New Construction requirements
- “Extra Duty”
- Tamper Resistant Receptacles
- New guarding requirements

FUNDAMENTALS OF BUILDING AND FACILITY ELECTRICAL SYSTEMS

- Types of industrial control systems
- Building electrical systems
- Electrical system riser diagram
- Ratings and specifications
- Ohm’s law review
- Interior building distribution
- Transformers—below 600V
- Switchboards and switchgear
- Busway—busduct
- Distribution centers
- Motor control centers and controls

- Panelboards and load centers
- Lighting contactors and switching
- Disconnects and safety switches
- NEMA enclosures
- Automatic transfer switches for generator systems
- UPS systems—uninterruptible power
- Fire alarm systems

PROPER PLANNING FOR DESIGN OR MODIFICATION OF BUILDING AND FACILITY ELECTRICAL SYSTEMS

- National Electrical Code®
- Design standards
- Safety
- Cost
- NEC® voltage classifications, basic ampacity rules, calculations, articles, tables and figures
- Voltage drop calculations
- Fault current ratings
- Mock building electrical calculations

PRACTICAL EXERCISES

Throughout this course includes multiple student exercises of sizing and connection examples for:

- Branch circuits
- Feeders
- Motors
- Transformers
- Controls