

# ELC-118 National Electric Code

## COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course covers the use of the current National Electrical Code. Topics include the National Electric Code (NEC) history, wiring methods, overcurrent protection, materials, and other related topics. Upon completion, students should be able to effectively use the NEC. Course Hours Per Week: Class, 1. Lab, 2. Semester Hours Credit, 2.

## LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Learn how to read and locate information in the National Electric Code book
2. Learn how the code is arranged in the book
3. Recognize symbols and drawings associated with electrical blueprints.
4. Design electrical systems based on calculations related to blueprint dimensions.
5. Perform calculations related to circuit loads, service loads, conductor sizing, box sizing, raceway sizing, and overload protection.
6. Learn how to perform electrical box fill calculations based on wire sizes
7. Understand how raceway and conductor calculations are done
8. Understand the general provisions for one family dwellings are handled
9. Perform load calculations for one family dwelling
10. Perform load calculations for multifamily dwelling
11. Perform load calculations for commercial locations
12. Become familiar with Hazardous, Health care and Industrial locations

## OUTLINE OF INSTRUCTION:

- I. Single family dwelling installations
  - A. Service entrance equipment selection
    1. Calculations based on the National Electrical Code (NEC)
    2. Clearance for service drops
    3. Service sizing
      - a. Disconnect selection
      - b. Heads and conductors
      - c. Grounding and bonding
      - d. Conduit and raceway
- II. Multi-family dwelling installations
  - A. Service entrance equipment
    1. NEC calculations
    2. Selecting service equipment
    3. Conductor size and type
    4. Grounding
  - B. Heat and air load calculations
    1. Conductor selection
    2. Circuit overload protection

- C. Branch circuits
    - 1. NCE calculation
    - 2. Conductor size and type
    - 3. Box sizing
    - 4. Raceway selection
    - 5. Circuit protection
    - 6. Grounding and bonding
  - D. Fixtures and appliance
    - 1. Conductor selection
    - 2. Raceway selection
- III. Commercial installations
- A. Service entrance equipment selection
    - 1. Load calculations
      - a. Transformer loads
      - b. Circuit protection
      - c. Raceway sizing and routing
    - 2. Branch panelboards
      - a. NEC calculations
      - b. Circuit protection
      - c. Conductor size and type
      - d. Raceway and routing
  - B. Telephone, communication and computer systems
    - 1. NEC requirements
    - 2. Power requirements
    - 3. Outlets installations
    - 4. Raceway sizing and routing
  - C. Special wiring methods
    - 1. Flat wiring
    - 2. Flexible wiring systems
- IV. Industrial installations
- A. Substation transformers
    - 1. Installation requirements
    - 2. Metering and service
    - 3. Grounding and bonding
  - B. Busways
- V. Specialized and hazardous locations
- A. NEC classes of hazardous locations
  - B. Divisions within hazardous location classes
  - C. Methods for reducing hazards
    - 1. Application of seals
    - 2. Location of equipment

**REQUIRED TEXTBOOK AND MATERIAL:**

The textbook and other instructional material will be determined by the instructor.