

# ELC-113 Residential Wiring

## COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course introduces the care/usage of tools and materials used in residential electrical installations and the requirements of the National Electrical Code. Topics include NEC, electrical safety, and electrical print reading; planning, layout; and installation of electrical distribution equipment; lighting; overcurrent protection; conductors; branch circuits; and conduits. Upon completion, students should be able to properly install conduits, wiring, and electrical distribution equipment associated with residential electrical installations. Course Hours Per Week: Class, 2. Lab, 6. Semester Hours Credit, 4.

## LEARNING OUTCOMES:

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

1. Identify and demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course.
2. Demonstrate appropriate use of test equipment, evaluate circuit performance and apply appropriate troubleshooting techniques to residential electrical circuits.
3. Draw, plan and interpret electrical plans and symbols used in residential applications.
4. Identify, size, and install wiring and electrical distribution equipment and devices associated with residential electrical installations in accordance with the National Electrical Code.
5. Recognize and demonstrate appropriate use of tools and materials that are used in residential wiring.

## OUTLINE OF INSTRUCTION:

- I. Review of electrical theory
  - A. Fundamental concepts
  - B. Circuit elements
  - C. Ohm's law
  - D. Electrical power and energy
  - E. Circuits
- II. Codes and standards
  - A. National electrical code
  - B. Listed equipment
- III. Blueprint reading of electrical plans
  - A. Specifications
  - B. Symbols and notations
  - C. Architect's scales
- IV. Tools, materials and equipment used in electrical installations
  - A. Hand tools
  - B. Equipment
  - C. Materials
  - D. Power tools

- V. Electrical connections
  - A. Splices
  - B. Type of connections
  - C. Methods
  
- VI. Services
  - A. Service entrance
  - B. Roughing in services
  - C. Service panels
  - D. Service drops
  - E. Service laterals
  - F. Trimming out the service
  
- VII. Wiring methods using non-metallic sheathed cable
  - A. Classify according to type
  - B. Junctions and splicings
  
- VIII. Wiring methods using conduit
  - A. Types of conduit
  - B. Methods of installations
  
- IX. Switches and switching circuits
  - A. Types of switches
  - B. Rating of switches
  - C. Single pole switch connections
  - D. Three-way switch connections
  - E. Methods of installation
  
- X. Introduction to “Low Voltage” systems
  - A. Remote control systems
  - B. Signaling systems
  - C. Security and fire systems
  
- XI. Large appliances
  - A. Electric ranges
  - B. Dryers
  - C. Washers
  - D. Water heater
  - E. Central heating and cooling
  - F. Baseboard heating
  - G. Ceiling heating
  - H. Furnaces
  - I. Heat pumps
  - J. Air conditioners
  - K. Motors
  
- XII. Multiple family dwelling
  - A. Wiring methods
  - B. Service considerations
  - C. Panelboards

- XIII. Electrical design
  - A. National electrical code requirements
  - B. Calculations of loads
  
- XIV. Estimating electrical wiring
  - A. Materials
  - B. Labor

**REQUIRED TEXTBOOK AND MATERIAL:**

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