

ELC 113
BASIC WIRING I

COURSE DESCRIPTION:

Prerequisites: None

Corequisites: None

This course introduces the care and use of tools and materials used in electrical installations as well as the requirements of the National Electrical Code. Topics include electrical safety and electrical blueprint 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 basic electrical installations. Course Hours Per Week: Class, 2. Lab, 6. Semester Hours Credit, 4.

LEARNING OUTCOMES:

A student that successfully completes this course will be able to:

- a. Understand the basic electrical theories.
- b. Understand the codes and standards related to residential wiring.
- c. Understand electrical plans.
- d. Use electrical installation tools.
- e. Use materials and equipment in electrical installations.

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

- I. Codes and standards
 - A. National electrical code
 - B. Listed equipment

- I. Blueprint reading of electrical plans
 - A. Specifications
 - B. Symbols and notations
 - C. Architect's scales

- I. Tools, materials and equipment used in electrical installations
 - A. Hand tools
 - B. Equipment
 - C. Materials
 - D. Power tools

- I. Electrical connections
 - A. Splices
 - B. Type of connections
 - C. Methods

- I. Services
 - A. Service entrance
 - B. Roughing in services
 - C. Service panels
 - D. Service drops
 - E. Service laterals
 - F. Trimming out the service

- I. Wiring methods using non-metallic sheathed cable
 - A. Classifying according to type
 - B. Junctions and splicings

- I. Wiring methods using armored flexible cable
 - A. Classifying according to type
 - B. Junctions and splicings

- I. Wiring methods using conduit
 - A. Types of conduit
 - B. Methods of installations

- I. Switches and switching circuits
 - A. Types of switches
 - B. Rating of switches
 - C. Single pole switch connections
 - D. Three-way switch connections
 - E. Four-way switch connections
 - F. Methods of installation

- I. Introduction to “Low Voltage” systems
 - A. Remote control systems
 - B. Signaling systems
 - C. Security and fire systems

- I. 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

- I. Multiple family dwelling
 - A. Wiring methods
 - B. Service considerations
 - C. Panelboards

- I. Electrical design
 - A. National electrical code requirements
 - B. Calculations of loads

- I. Estimating electrical wiring
 - A. Materials
 - B. Labor

REQUIRED TEXTBOOKS AND MATERIAL:

Mullin, Ray C. Electrical Wiring Residential. 15th ed. Delmar Publishers, Inc., 2005.

National Fire Protection Association, National Electrical Code.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.