Residential Wiring

This one-credit course is designed to provide students with the fundamental knowledge and skills for this area of the construction industry. This course emphasizes safety, grounding, conduit and electrical metallic tubing (EMT) bending, boxes and fittings, conductor installation, conductor termination and splices, installation of electrical services, circuit breakers and fuses, and residential wiring systems. Upon successful completion of this course, students are able to wire a house with limited supervision.

Career and technical student organizations are integral, cocurricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Safety

Students will:

1. Demonstrate safety procedures as recognized by governing agencies and approved industry standards when testing and replacing components or installing wiring in residential applications.
   Examples: lockout, tagout

2. Identify electrical hazards and how to avoid and minimize them in the residential construction environment.

Grounding

3. Explain the purpose of grounding systems in residential wiring applications.

4. Distinguish between ground faults and short circuits in residential wiring applications.

5. Describe the difference between system grounding and equipment grounding related to residential wiring.

6. Demonstrate the installation of various grounding devices related to residential wiring.

Conduit and Electrical Metallic Tubing Bending

7. Demonstrate the process of conduit bending according to specifications using hand and power equipment.
   - Computing angles for conduit bends and offsets
   - Demonstrating procedures for correcting and modifying existing conduit and EMT bends
Boxes and Fittings

8. Calculate type and size of electrical boxes based on application, number, and size of conductors using the National Electrical Code (NEC) handbook.
   - Demonstrating the ability to locate and install electrical boxes according to the NEC handbook
   - Explaining the NEC requirements for supporting lighting fixtures
   - Demonstrating the ability to install lighting fixtures according to specifications

Conductor Installation

9. Select the correct size and type of conductors for residential wiring applications and NEC handbook.

10. Demonstrate different methods for installing common conductors used in residential wiring.

Conductor Termination and Splices

11. Produce quality conductor terminations.

12. Demonstrate the procedure for installing lugs and connectors onto conductors.

13. Explain the importance of using correct bolt torque when working with bus bars.

14. Demonstrate correct conductor splicing and crimping.

Installation of Electrical Services

15. Install main disconnects, switches, panel boards, and over-current protection.
   - Describing various types of residential electrical service installations
   - Calculating circuit loads for installation of electrical services

Circuit Breakers and Fuses

16. Identify devices used for over-current protection.

17. Describe the operation of circuit breakers and fuses.

Residential Wiring Systems

18. Use a specific plan to complete a wiring project for residential applications.