

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Electrical/Electromechanical Technology Program
Revision Date: August 26, 2019

I. CATALOG DESCRIPTION

Course Number: ELEC1366
Course Title: Residential and Commercial Wiring I
Prerequisite(s): ELEC1217 or special permission
Catalog Description: Practical experience in the construction of residential wiring systems.
Design, layout and estimating of a residential electrical system based on the National Electrical Code (NEC).
Credit Hours: 5
Class Hours: 45
Lab Hours: 90
Total Contact Hours: 135

II. COURSE OBJECTIVES: *Course will:*

- A. Demonstrate basic wiring methods.
- B. Explain beginning code level assessment and comprehension.
- C. Identify basic tool use.
- D. List general wiring methods.
- E. Show general wiring materials.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Install electrical equipment in accordance with the National Electrical Code (NEC) minimum safety requirements.
 - 2. Use the correct wire size for the application.
 - 3. Demonstrate ability to navigate NEC.
 - 4. Find definitive articles within the NEC.
 - 5. Identify equipment used in the electrical industry.
 - 6. Use hand tools safely.
 - 7. Install equipment correctly following the NEC.
 - 8. Use correct conduit bending techniques.
 - 9. Identify different devices used in the electrical field.
 - 10. Install fixtures and devices in electrical circuits.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #1: Oral Communication
Outcome 5: Utilize active and critical listening behaviors.

IV. CONTENT/TOPICAL OUTLINE

- A. FUNDAMENTAL OF ELECTRICAL WORK
 - 1. Theory –
 - a. Electrical History
 - b. Terminology
 - c. Types of material
 - d. Regulation of permits
 - e. Safety

2. REMARKS: To give the student the necessary communication for terminology in the electrical field.
- B. GENERAL REQUIREMENTS FOR BRANCH CIRCUITS**
 1. Theory –
 - a. Wiring diagrams
 - b. Color coding of wires
 - c. Number of conductors in box
 - d. Box sizes (NEC)
 - e. Current code (NEC)
 2. REMARKS: To give the student understanding of the basic principles regarding electrical devices and electrical circuit.
- C. INSTALLING LIGHTING OUTLETS AND SWITCHING DEVICES**
 1. Lab –
 - a. Single pole switches
 - b. Three way switches
 - c. Four way switches
 - d. Receptacles
 2. REMARKS: To give the student a working knowledge of the correct wiring of switches, lights and receptacles with the proper National Electrical Code.
- D. GROUNDING AND BONDING**
 1. Theory –
 - a. Systems circuits and equipment required to be or not to be grounded
 - b. Types of material
 - c. Operating principles
 - d. Type of GFCI
 - e. Calculating of ground fault
 2. REMARKS: To make the student familiar with general requirements for grounding and bonding of electrical installations
- E. GENERAL LIGHTING**
 1. Theory –
 - a. Conductors for general lighting
 - b. Fixture sizes (NEC)
 - c. Flexible cord and cable
 - d. Types of mounting
 2. REMARKS: To give the student general design and installation of lighting fixtures and conductors that apply.
- F. MOCK-UPS**
 1. Lab –
 - a. Doorbell wiring
 2. REMARKS: To give students hands-on experience of equipment installation and hook up.
- G. BRANCH CIRCUIT & FEEDER CALCULATION**
 1. Theory –
 - a. Current Code (NEC)
- H. ELECTRICAL LAYOUT FROM BLUEPRINT**
 1. Theory –
 - a. Drawing up circuit layout that requires minimum use of wire.
 - b. Determining locations for appliance, switches and light.
 - c. Specification
 - d. Service calculation

2. REMARKS: To give the student a working knowledge of the work involved in locating and planning a wiring layout.
- I. INVENTORY & BILLING**
1. Lab -
 - a. Parts list
 - b. Computer Aided Estimating
 2. REMARKS: To give the student hands on experience of pricing material and estimating jobs used also for blue print layout.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): NFPA, *National Electric Code*, Latest Edition and Mullen, *Electrical Wiring (Residential)*
- B. Other Resources: Handouts and Special handout material and books used
- C. Supplies: Colored pens or pencils, Scale Rule, and Tool Kit
- D. ELECTRICAL TOOL REQUIREMENT:
 1. Tool Pouch
 2. Tool Belt
 3. Aluminum torpedo level (magnetic base)
 4. Steel locking tape (3/4" x 25' minimum)
 5. Electrician's knife or utility knife
 6. Hammer
 7. 6 3/4" diagonal cutters (with plastic dip handles)
 8. 6" long nose pliers with cutters (with plastic dip handles)
 9. 9 1/4" lineman pliers (with plastic dip handles)
 10. #2 Phillips screwdriver with a 4" shank
 11. Standard screwdriver 3/16" blade with 6" shank
 12. 10" Pump pliers
 13. 10" Adjustable wrench
 14. 1/4" nut driver
 15. 5/16" nut driver
 16. Meter-DMM (see instructor)
 17. Non-tinted Safety glasses
 18. Carpenters pencil
 19. Hard Hat

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 1. Lecture
 2. Overhead
 3. Onsite demonstrations

VII. METHODS OF EVALUATION

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 1. Theory grade will be a combination of tests, quizzes and homework projects.
 2. Lab Grade
 - a. Lab Projects
 - b. Work Qualities
 1. Done according to NEC requirements.
 2. Done based off of article 110.12 of the NEC.
 3. Project works as described in lab procedure.

4. Student works safely.
5. Student shows employability characteristics.

VIII. SPECIFIC COURSE REQUIREMENTS

- A. A minimum grade of D is required.
- B. Cheating within the Manufacturing Division: Any violation of academic integrity on assignments, quizzes, or tests will result in a grade of 0 on that assignment, quiz, or test. A second violation in any course after the initial infraction will result in a grade of F for that course. Any additional violations while in the program will result in a suspension from the program.
- C. Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.