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

I. CATALOG DESCRIPTION

Course Number:	ELEC1367
Course Title:	Residential and Commercial Wiring II
Prerequisite(s):	ELEC1366
Catalog Description:	A continuation of Residential and Commercial Wiring I. 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.

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.** 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.

B. CONDUIT RACEWAYS
- **1.** Theory
  - **a.** Electrical metallic tubing (EMT)
  - **b.** Flexible metal conduit
  - **c.** Wiremold
  - **d.** Intermediate metal conduits
  - **e.** Bending of conduit (EMT)
- **2.** REMARKS: To make the student familiar with the types of raceway that is used in the field.

C. CONDUIT BENDING (EMT)
- **1.** Lab
  - **a.** Conduit bending equipment
  - **b.** Type of bends
  - **c.** Application of bends
- **2.** REMARKS: To teach the student bending of conduit and how to use equipment.

D. FUSES AND BREAKERS
- 1. Theory
  - **a.** Types of fuses and breakers
  - **b.** Design
  - **c.** Rating
  - **d.** Interrupting rating

E. SPECIAL PURPOSE EQUIPMENT
- 1. Theory
  - **a.** Ranges
  - **b.** Water heaters
  - **c.** Calculation of circuits
  - **d.** Air conditioning
  - **e.** Dryers
  - **f.** Range hoods
  - **g.** Heat, vent, and light
- **2.** REMARKS: To introduce the student to large electrical appliances and how the electrical installations are installed and calculated in NEC

F. MOCK-UPS
- **1.** Lab
  - **a.** Fire alarm
  - **b.** Low voltage
- **2.** REMARKS: To give students hands-on experience of equipment installation and hook up.

G. BRANCH CIRCUIT & FEEDER CALCULATION
- 1. Theory
  - a. Methods
  - b. Sizing of panel boards
  - c. Lighting loads
  - d. Sizing neutral
- **2.** REMARKS: To give the student a working understanding of how the NEC calculates service entrance equipment.

H. BLUEPRINT READING
- **1.** Lab
  - **a.** Work book material
  - **b.** Typical plans
  - **c.** Specifications

d. Symbols
e. Terminology

2. REMARKS: To introduce the student to plans and symbols necessary to interpret blueprints.

I. 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.

J. NEW HOUSE LAYOUT

1. Theory
a. Layout
b. Materials list
c. Calculation of service entrance
d. Electrical Permits
e. Lighting fixtures

2. REMARKS: The student will learn to design electrical layout, and estimate plan. They will wire a house in the fourth semester.

K. SPECIALTY AREAS

1. Theory
   a. Swimming pool
   b. Remote control
   c. Fire alarm

2. REMARKS: To teach the student the principles that applies in design and application of equipment and installation.

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 ¾" diagonal cutters (with plastic dip handles)
8. 6" long nose pliers with cutters (with plastic dip handles)
9. 9 ¼" 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. ¼" 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, homework and a final project.
- **2.** Lab grade will consist of lab projects.

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.