

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Heating, Ventilation, Air Conditioning & Refrigeration Technology Program
Revision Date: August 2025

I. CATALOG DESCRIPTION

Course Number: HVAC1330
Course Title: Residential Controls I
Prerequisite(s): HVAC1109
Catalog Description: Basic furnace/central air conditioning control circuits, electrical schematics, equipment components, basic installation, operational sequencing, equipment maintenance, and standard safety requirements.
Credit Hours: 2
Class Hours: 15
Lab Hours: 45
Total Contact Hours: 60

II. COURSE OBJECTIVES: *Course will:*

- A. Describe forced air heating systems by classification.
- B. Describe control locations and component symbols.
- C. Explain basic electricity theory, pictorial wiring diagrams, and schematic (ladder) diagrams.
- D. Discuss wiring, system operation, safety, and maintenance procedures for residential heating controls
- E. Describe different types of thermostats, air conditioning components, and refrigeration operation.
- F. Explain developing good troubleshooting techniques.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Distinguish forced air heating systems by classification.
 - 2. Identify controls used on residential cooling equipment.
 - 3. Interpret basic electrical wiring diagrams.
 - 4. Recognize proper system operation, safety, and maintenance procedures for residential cooling systems and controls.
 - 5. Operate the different types of thermostats and cooling systems and heat pumps.
 - 6. Demonstrate the basis of good troubleshooting techniques.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE

- A. Forced Air Heating and Cooling Classifications & Control Locations
- B. Alternating Current Circuits
- C. Electrical Pictorials & Symbols
- D. Schematics (Ladders) & special circuits
- E. Electrical Components
- F. Safety
- G. Troubleshooting
- H. HVAC Trainer

I. Thermostats

V. INSTRUCTIONAL MATERIALS

- A.** Required Text(s): Handouts given by Instructor
- B.** Other Resources: Manufacturers' Materials (provided by instructor)

VI. METHODS OF PRESENTATION/INSTRUCTION

- A.** Methods of presentation typically include a combination of the following:
 - 1.** Lectures
 - 2.** Classroom demonstrations
 - 3.** Classroom discussions
 - 4.** Instructional handouts
 - 5.** Video presentations
 - 6.** PowerPoint presentations

VII. METHODS OF EVALUATION

- A.** Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1.** Quizzes
 - 2.** Lab Projects
 - 3.** Final Comprehensive Test

VIII. SPECIFIC COURSE REQUIREMENTS

- A.** Student must meet all of the following to receive a passing grade:
 - 1.** Achieve a passing grade of "D" (60%) or higher, based on SCC grading scale.
 - 2.** Submit own work. Students turning in homework, reports, field notes, or calculations by someone other than themselves will receive 0% and be referred to the Division Dean and Dean of Students for further disciplinary action. Consequences can include failing the course.
 - 3.** Demonstrate attitude, skills, and character commensurate with industry standards.