

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

I. CATALOG DESCRIPTION

Course Number: HVAC1226
Course Title: Refrigeration Lab I
Prerequisite(s): None
Corequisite(s): HVAC1109, HVAC1131 and HVAC1132
Catalog Description: Basic refrigeration service fundamentals with emphasis on students physically constructing, leak checking, evacuating, electrical wiring, refrigerant charging, refrigerant recovery, start up, and performing system checks on a basic refrigeration system.
Credit Hours: 3.0
Class Hours: 15
Lab Hours: 90
Total Contact Hours: 105

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce basic electrical wiring diagrams to properly control medium temperature fractional horsepower R-134a refrigeration systems.
- B. Introduce and put into practice the eight basic steps in servicing a basic refrigeration sealed system.
- C. Assemble a medium temperature fractional horsepower R-134a refrigeration system.
- D. Introduce refrigeration service technician objectives and refrigeration field service application and techniques.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Analyze, construct, and apply basic electrical wiring diagrams to properly control a medium temperature fractional horsepower R-134a refrigeration system.
 - 2. Demonstrate the ability to use tools and procedures required for installation, charging, refrigerant recovery, and repairing a medium temperature fractional horsepower R-134a refrigeration system.
 - 3. Start-up and operate a medium temperature fractional horsepower R-134a refrigeration system.
 - 4. Identify and record operational baseline temperatures, voltages, amperages, and system refrigerant pressures.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
Outcome 4: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE

- A. Eight steps to service a sealed system fault
- B. Overview of basic HVAC/R motor operation
- C. Hermetic compressor RSIR and CSIR wiring
- D. Assemble a basic refrigeration lab trainer
- E. Wire a basic refrigeration system

- F. Line taps and service valves
- G. Refrigeration manifold gauges
- H. Leak detection
- I. Evacuation
- J. Refrigeration charging
- K. Performance checks on operating refrigeration trainer
- L. Refrigerant recovery

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Althouse, Turnquist, Bracciano, Bracciano, and Bracciano, *Modern Refrigeration and Air Conditioning*, 20th Edition Ebook
- B. Other Resources: Course material on Canvas accessible through the SCC Hub, Student Notes and Instructor Handouts from previous semesters
- C. Supplies: Writing utensils, notebook paper and clipboard

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. Tests
 - 2. Assessment Quizzes
 - 3. Lab Assessment

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.