

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

I. CATALOG DESCRIPTION

Course Number: HVAC2649
Course Title: Commercial HVAC Systems
Prerequisite(s): HVAC1461
Catalog Description: Theory and practices of commercial air conditioning system operation. Basic fundamentals of human comfort, psychrometrics, geothermal systems and applications.
Credit Hours: 3.0
Class Hours: 30
Lab Hours: 45
Total Contact Hours: 75

II. COURSE OBJECTIVES: *Course will:*

- A. Develop an understanding of the principles and engineering practices as applied to the installation and maintenance of a commercial HVAC system.
- B. Explain the properties of air and the need for proper indoor air quality.
- C. Develop the knowledge to troubleshoot commercial HVAC systems and the controls that operate them.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Analyze a commercial HVAC system and proper troubleshooting procedures.
 - 2. Develop a preventative maintenance program for HVAC systems.
 - 3. Distinguish the differences between different types of air filters and the benefits.
 - 4. Identify Building management systems.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #3: Critical Thinking & Problem Solving
 - Outcome 5: Acquire and integrate knowledge and construct relationships across disciplines.

IV. CONTENT/TOPICAL OUTLINE

- A. HVAC/Thermodynamic/Heat Transfer/Pneumatic Terms
- B. Heat Transfer Fundamentals
- C. Human Comfort Analysis
- D. Calculations of Heat Gains & Heat Losses
- E. Properties of Air & Psychrometric Charts
- F. Air Mixture Calculations
- G. Conditioned Air Supply Calculations
- H. Refrigeration & Cooling Equipment

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Althouse, Turnquist, Bracciano, Bracciano, and Bracciano, *Modern Refrigeration and Air Conditioning*, 20th Edition Ebook

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
 - 7. Speaker(s)
 - 8. Field Trip(s)
 - 9. Lab Projects

VII. METHODS OF EVALUATION

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Tests
 - 2. Quizzes
 - 3. Lab Project

VIII. SPECIFIC COURSE REQUIREMENTS

- A. Student must meet all of the following to receive a passing grade:
 - 1. 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.
 - 2. Demonstrate attitude, skills, and character commensurate with industry standards.
 - 3. All program policies of the Heating, Ventilation, Air Conditioning, & Refrigeration Technology program will be strictly enforced.