

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

I. CATALOG DESCRIPTION

Course Number: HVAC1251
Course Title: Hydronic Heating
Prerequisite(s): None
Catalog Description: Hot water heating systems emphasizing their classifications, ratings, component requirements, and installation practices for residential/small commercial systems.
Credit Hours: 3
Class Hours: 30
Lab Hours: 45
Total Contact Hours: 75

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce the fundamental concepts of hydronic heating systems.
- B. Introduce the different types of components used in hydronic systems.
- C. Explain different types of radiant floor systems and proper installation.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Identify the differences between forced air heating and hydronic heating.
 - 2. Develop the ability to design and install an energy efficient residential hydronic system.
 - 3. Identify the difference between conventional and condensing boilers.
 - 4. Recognize components in a hydronics system, pumps, expansion tank, pressure relief valve, and controls.
- 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. Welcome to the World of Hydronics
- B. Fundamental Concepts
- C. Piping, Fittings and Valves
- D. How water temperatures affect system components
- E. Fluid Flow in Piping
- F. Circulating Pumps
- G. Heat Emitters
- H. Expansion Tanks
- I. Hydronic Heat Sources

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Steeby, Donald L. Hydronic Heating Systems and Application 2nd Edition
- B. Supplies: 3-Ring notebook and Calculator

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. Lab demonstrations
 - 5. Instructional handouts and worksheets
 - 6. Video presentations
 - 7. 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. Quizzes
 - 3. Lab participation

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.
 - 4. HVAC Program required tools and supplies.