

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Heating, Ventilation, Air Conditioning & Refrigeration Technology Program
Revision Date: August 26, 2019

I. CATALOG DESCRIPTION

Course Number: HVAC1132
Course Title: Piping Practices
Prerequisite(s): None
Catalog Description: Study of materials and methods used in the installation and service of HVAC/R equipment. Copper, aluminum, and steel pipe soldering/brazing, copper-tube bending, usage of different heat sources, nitrogen purging, hands-on lab projects, HVAC/R safety standards, hazard communications, and use of safety data sheets stressed.
Credit Hours: 2
Class Hours: 0
Lab Hours: 90
Total Contact Hours: 90

II. COURSE OBJECTIVES: *Course will:*

- A. Identify different types of copper tubing and fitting materials used in the HVAC/R trades.
- B. Explain different tools used to form tubing to prepare it for soldering and brazing.
- C. Identify different types of torches used in the industry.
- D. Explain hazards associated with the HVAC/R trades.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Identify the difference between ACR (annealed) and Nominal (hard drawn) copper.
 - 2. Recognize different types of heat sources used for soldering and brazing along with proper B-tank and oxy-Acetylene torch set-up and storage.
 - 3. Identify different types of solder, brazing rod and fluxes used for soldering and brazing.
 - 4. Explain and display how to figure fitting allowances, offsets, 45° and 90° bends.
 - 5. Display proper safety practices.
- 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. Soldering and Brazing Equipment
- B. Copper, Aluminum and Steel Pipe
- C. Copper, Aluminum and Steel Tubing
- D. Calculating Fitting Allowance
- E. Soft Solder
- F. Soldering and Brazing Standards
- G. Silver Brazing
- H. Brazed Joints
- I. Soldering & Brazing Copper Tube

- J. Fabricating Large Diameter Tube & Fittings
- K. Electronic Calculations
- L. Safety Videos

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): None
- B. Other Resources: HVAC1132 Handouts given by Instructor
- C. Supplies: Tools required by the HVAC/R program, calculator, writing utensils and notebook paper

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lab demonstrations
 - 2. Lab assistance
 - 3. Instructional handouts
 - 4. Video presentations
 - 5. PowerPoint presentations
 - 6. Speaker(s)

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 Projects

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.