

# APPT 151: RF 101 BASIC REFRIGERATION SERVICE SKILLS

## Foothill College Course Outline of Record

Heading	Value
<b>Units:</b>	5
<b>Hours:</b>	40 lecture, 78 laboratory per quarter (118 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Air Conditioning & Refrigeration Technology Apprenticeship Program.
<b>Advisory:</b>	Not open to students with credit in APPR 131.
<b>Degree &amp; Credit Status:</b>	Degree-Applicable Credit Course
<b>Foothill GE:</b>	Non-GE
<b>Transferable:</b>	None
<b>Grade Type:</b>	Letter Grade (Request for Pass/No Pass)
<b>Repeatability:</b>	Not Repeatable

## Student Learning Outcomes

- A student will be able to identify partners in an apprenticeship.
- A student will be able to demonstrate knowledge of safe work practices.
- A student will be able to demonstrate the proper use of pipe cutting and threading tools.

## Description

Orientation to the apprenticeship program, JATC policies and procedures. UA history and heritage will also be covered. Safety training is introduced, with instruction in general construction safety and hazardous materials awareness. Necessary trade skills, including pipe and tube installations and soldering and brazing.

## Course Objectives

The student will be able to:

- Describe the apprenticeship process
- Describe Union Heritage
- Work safely on the job
- Demonstrate proficiency in pipe joining and installation skills
- Perform soldering and brazing

## Course Content

- Describe the apprenticeship process
  - Training Center facility and staff
  - JATC policies and procedures
- Describe Union Heritage
  - History of the UA
  - Identify partners in an apprenticeship
  - The collective voice
  - Role and responsibilities of contractors

- Characteristics and goals of outstanding journeymen

C. Work safely on the job

- Purpose and responsibilities of OSHA

- Workplace hazards

- Fall protection

- Personal Protective Equipment (PPE)

- Electrical safety, tool safety, stairway and ladder safety

- Proper methods for lifting and carrying objects

- Confined spaces

- Fire safety

D. Demonstrate proficiency in pipe joining and installation skills

- Describe common terms associated with steel pipe and fittings

- Steel pipe threading and joining

- Identify the types and uses of various refrigeration fittings

- Components and functions of hangers and supports

- Build piping project based on isometric drawing interpretation

- Pressure testing

E. Perform soldering and brazing

- Identify the common types of fittings used with copper ACR tubing

- Describe the manufacture and materials of copper pipe and ACR tubing

- Types of solder used for joining copper tube

- Types of brazing filler metal used for joining copper tube

- Types of flux used for soldering and brazing copper tube

- Prepare and assemble copper joints

- Perform soldering process

- Make a brazed joint

F. Demonstrate customer service skills

- Determine customer needs

- Demonstrate appropriate communication skills

- Maintain a quality service attitude

- Evaluate customer satisfaction

## Lab Content

Students will work individually and in teams on safe practices of joining and installing ACR piping system components.

## Special Facilities and/or Equipment

- Laboratory with refrigeration service tools
- Personal protective equipment

## Method(s) of Evaluation

- Results of written exercises and final examination
- Satisfactory completion of hands-on projects
- Maintenance of a student's workbook with questions drawn from text
- Group and classroom participation

## Method(s) of Instruction

- Lecture
- Lab Assignment
- Group Discussion
- Demonstration

## Representative Text(s) and Other Materials

International Pipe Trades Joint Training Committee. Standard for Excellence. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc., 2013.

International Pipe Trades Joint Training Committee. UA Pipe Fittings, Valves, Supports and Fasteners. Upper Marlboro, MD: International Pipe Trades Joint Training Committee Inc., 2012.

International Pipe Trades Joint Training Committee, Inc. Soldering and Brazing. Upper Marlboro, MD: International Pipe Trades Joint Training Committee, Inc, 2015.

Mechanical Service Contractors Association. MSCA Customer Service Training Series. Rockville, MD: Mechanical Service Contractors of America, 2009.

Avuil, Ronnie J. HVAC and Mechanical Systems Training Manual. Orland Park, IL: American Technical Publishers, 2014.

Note: Although one or more of these texts are older than the recommended 5 years they conform to national training standards and are considered seminal works in the discipline. We will adopt the next edition of each text, as it is published.

## **Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments**

A. Readings from assigned textbooks:

1. Articles and lessons on Union Heritage, chapters 1-3
2. Laws and manuals containing safety rules and regulations for various pertinent agencies
3. Tool maintenance manuals

B. Writing assignments given in the laboratory:

1. Essays on the development, impact and importance of unions in the United States
2. Essay and exams on the importance of safety rules and regulations governing construction

## **Discipline(s)**

Air Conditioning, Refrigeration, Heating