

APPT 151: RF 101 BASIC REFRIGERATION SERVICE SKILLS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	7
Hours:	72 lecture, 36 laboratory per quarter (108 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Air Conditioning & Refrigeration Technology Apprenticeship Program.
Advisory:	Not open to students with credit in APPR 131.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	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 is also 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
- Demonstrate knowledge of proper handling of refrigerants
- Demonstrate basic office computer skills

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
- 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
- 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
- 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
- Demonstrate customer service skills
 - Determine customer needs
 - Demonstrate appropriate communication skills
 - Maintain a quality service attitude
 - Evaluate customer satisfaction
- Demonstrate safe handling and recovery of refrigerants
 - Document EPA guidelines for safe recovery
 - Demonstrate proper recovery techniques
- Demonstrate basic office computer skills
 - Excel spreadsheets
 - Recording data in computer files
 - Organize service and maintenance files
 - Web-based research of technical support information

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

1. Laboratory with refrigeration service tools
2. Personal protective equipment
3. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

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

Methods of Instruction may include but are not limited to the following:

Lecture
Lab assignment
Group discussion
Demonstration

Representative Text(s) and Other Materials

International Pipe Trades Joint Training Committee, Inc.. Standard for Excellence. 2013.

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

International Pipe Trades Joint Training Committee, Inc.. Soldering and Brazing. 2015.

Mechanical Service Contractors Association. MSCA Customer Service Training Series. 2009.

Auvil, Ronnie J.. HVAC and Mechanical Systems Training Manual. 2014.

International Pipe Trades Joint Training Committee, Inc.. Conservation and Safe Handling of Refrigerants. 2019.

Although some of these textbooks are older than 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:
 - i. Articles and lessons on Union Heritage, chapters 1-3
 - ii. Laws and manuals containing safety rules and regulations for various pertinent agencies
 - iii. Tool maintenance manuals

- b. Writing assignments given in the laboratory:
 - i. Essays on the development, impact, and importance of unions in the United States
 - ii. Essay and exams on the importance of safety rules and regulations governing construction

Discipline(s)

Air Conditioning, Refrigeration, Heating