

# APPR 160A: HVAC TECH, CUSTOMER SERVICE

## Foothill College Course Outline of Record

Heading	Value
<b>Effective Term:</b>	Summer 2021
<b>Units:</b>	5
<b>Hours:</b>	37 lecture, 86 laboratory per quarter (123 total per quarter)
<b>Prerequisite:</b>	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
<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

- 2- Explain the use and operation of heat pumps.
- 1- Explain the importance and demonstrate the use of the refrigerant recovery equipment.

## Description

Third-year course of the Plumber, Pipefitter & Service Tech Apprenticeship Program regarding HVAC students; includes basic refrigeration, EPA 608 certification, safety and customer service.

## Course Objectives

The student will be able to:

- Demonstrate a working knowledge of HVAC related science
- Explain the terminology commonly used in the HVAC industry
- Explain and demonstrate use of the Mollier diagram
- Demonstrate an operational command of the heat pump
- Demonstrate a working knowledge of the common controls used in HVAC
- Explain the different types of refrigerants and demonstrate their application
- Pass the EPA 608 CFC certification program
- Explain the basic principles of customer service as it relates to the HVAC industry
- Explain and use safety policies, procedures, and guidelines

## Course Content

- HVAC Related Science
  - Demonstrate understanding of pressure, temperature and flow laws
  - Use mathematical formulas to show understanding of those laws
- Use of Terms
  - Demonstrate command of commonly used terms of HVAC
  - Define the use and application of those terms
- Mollier Diagram
  - Demonstrate a command of the Mollier diagram

- Calculate flow rate, HP, volumetric capacity, SEER using the Mollier diagram
  - Measure operating system at school and plot on a Mollier diagram
- D. Heat Pump
- Review and demonstrate the operation and components of the heat pump
  - Practice troubleshooting theoretical problems
- E. Basic Controls
- Review and identify basic controls used in small tonnage HVAC equipment
  - Demonstrate understanding of control symbols on electrical diagrams
  - Review new microprocessor controls now being implemented in the HVAC industry
- F. Refrigerants
- Understand types of refrigerants in the HVAC industry
  - Demonstrate knowledge of proper handling and safe working practices
  - Demonstrate use of recovery equipment
- G. EPA 608 Certification
- Review EPA 608 laws rules and application
  - Pass proctored test for certification
- H. Customer Service
- Review relationships between customer, tech, office
  - Review proper paperwork completion
- I. Safety
- Nightly review of "toolbox" topics
  - Students to lead safety topics by mid-term

## Lab Content

Students will work individually and in teams on practical projects to learn:

- Use of recovery equipment
- Log operation on Hampton trainer
- Service on-site HVAC equipment
- Customer service role playing
- Proper selection and use of PPE (ongoing through out the term)

## Special Facilities and/or Equipment

- JATC operation equipment to be used as training
- Hampton trainers

## Method(s) of Evaluation

Group and classroom participation  
Hands-on demonstration  
Written examination

## Method(s) of Instruction

Lectures and classroom discussion on course material  
Classroom hands-on with tools and equipment  
Demonstrate learned skills in front of peers

## Representative Text(s) and Other Materials

International Pipe Trades Training Committee. HVACR Training Manual, Vols. 1 and 2. 2008.

Although this text is older than the suggested "5 years or newer" standard, it remains a seminal text in this area of study.

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

A. Readings from HVACR Training Manual, Vol. 1: Unit 3, Refrigeration and Refrigerants, and Unit 23, Compressors

B. Writing assignments include review worksheets for Unit 3 and Unit 23 in HVACR Training Manual, Vol. 1

## **Discipline(s)**

Air Conditioning, Refrigeration, Heating