

APPRENTICESHIP - AIR CONDITIONING MECHANIC

Program Description

The Air Conditioning Mechanic program is offered in partnership with Sheet Metal Local 104 and Bay Area Training Fund. This 5-year apprenticeship program provides students with in-class instruction and paid on-the-job training with a sheet metal contractor, in the service sector of the sheet metal and heating, ventilating and air conditioning (HVAC) industry. The students will perform scheduled maintenance and troubleshoot system problems while dealing directly with a variety of customers. The students utilize understanding of refrigerant, electronic and pneumatic controls, filtration and duct systems to maintain safe and efficient system performance. Mechanics use test equipment to verify conditions, research manufacturer's data, and then adjust, repair, and replace components as needed. Sheet Metal Air Conditioning Service Mechanics work on residential, light commercial, and, more often, complex commercial systems. Upgrade training is common in this occupation as more advanced and "greener" equipment is produced. Per California Code of Regulations, this program is limited to students admitted to the Sheet Metal Local 104 & Bay Area Industry Training Fund's Air Conditioning Mechanic Program.

Students who complete the core and support courses for the program will satisfy Foothill's local general education (GE) requirements for Area 1B, Oral Communication and Critical Thinking; Area 2, Mathematical Concepts and Quantitative Reasoning; Area 4, Social and Behavioral Sciences; Area 5, Natural Sciences (with Laboratory); and Area 7, Lifelong Learning. To meet the requirements for the Associate in Science in Air Conditioning Mechanic, you will only need to complete three additional GE courses—to satisfy Area 1A, Area 3, and Area 6—and 21 units of Cooperative Work Experience (CWE).

Upon completion of the program, students will be eligible to receive an Apprenticeship Completion Certificate from the California Division of Apprenticeship Standards (DAS) and a Certificate of Achievement from Foothill College. Graduates will be employable as HVAC Service Technicians/Mechanics, HVAC Service Managers, HVAC Contractors, NATE-Certified Air Conditioning Mechanics, Test, Adjust & Balancing Technicians, Building Inspectors, forepersons, estimators, detailers, contractors, instructors, project managers, and in other related occupations.

Learn more about the program on the [Apprenticeship website](#).

Program Learning Outcomes

- Students will be able to achieve EPA 608 and OSHA 30 Certifications.
- Students will be able to understand the different types, properties, and application of refrigerants.
- Students will be able to demonstrate the ability to measure, cut, bend, and make various types of tubing and piping connections.
- Students will be able to demonstrate the safe use of soldering and brazing equipment.
- Students will be able to explain functions of special components: filter driers, sight glass, suction line accumulator, liquid line receiver, hot gas bypass, ambient controls.
- Students will be able to explain the application and operational sequence of electric and gas heating.
- Students will be able to understand the different types of heat sources for hydronic heating (water, steam, geothermal/waste heat, solar).
- Students will be able to perform start-up, diagnosis, repair, and maintenance of cooling towers and pumps.
- Students will be able to demonstrate an understanding of green construction and energy conservation as it applies to the HVAC industry in California.
- Students will be able to explain the LEED rating system, and how it involves HVAC maintenance over the life of the building.

Career Opportunities

Upon completion of the Air Conditioning Mechanic program, students will be eligible to receive a Certificate of Achievement in Air Conditioning Mechanic from Foothill College and an Apprenticeship Completion Certificate from the California Division of Apprenticeship Standards (DAS). The graduates will be employable as HVAC Service Technician/Mechanic; HVAC Service Manager; HVAC Contractor; NATE Certified Air Conditioning Mechanic; Test, Adjust & Balancing Technician; Building Inspector; foreperson; estimator; detailer; contractor; instructor; project manager; and other related occupations.

Award Type(s)

- AS = Associate in Science Degree
- CA = Certificate of Achievement

Units Required

- Major: 58.5-61
- Certificate(s): 58.5-61

Associate Degree Requirements

A minimum of 90 units is required¹ to complete the associate degree, including:

- Core and support courses for the major (58.5-61 units total)
- Completion of one of the following general education patterns:
 - Foothill College General Education
 - **Summer Session 2025 only**—CSU General Education Breadth (CSU GE Breadth)²
 - **Summer Session 2025 only**—Intersegmental General Education Transfer Curriculum (IGETC)²
 - **Beginning Fall Quarter 2025**—California General Education Transfer Curriculum (Cal-GETC)³

¹ Additional elective course work may be necessary to meet the 90-unit minimum requirement for the associate degree.

² Summer Session 2025 is the final term during which CSU GE Breadth and IGETC may be used. Please see a counselor for more information.

³ Cal-GETC begins in Fall Quarter 2025. Please see a counselor for more information.

Note: A grade of "C" (or "P") or better is required for all core and support courses used for the degree or certificate. In addition, the student must obtain a minimum GPA of 2.0.

Refer to the Associate in Arts & Associate in Science Degree Requirements page for complete information about graduation requirements and catalog rights.

Core and Support Courses

Code	Title	Units
Core Courses		
APSM 151A	SERVICE INTRODUCTION & SAFETY	2.5
APSM 151B	ESSENTIAL HVAC SERVICE SKILLS	2.5
APSM 152A	PIPING, REFRIGERANT EVACUATION & RECOVERY	1.5
APSM 152C	INTRODUCTION TO ELECTRICITY	2.5
APSM 153B	ELECTRIC MOTORS & MOTOR CONTROLS IN HVAC SYSTEMS	2.5
APSM 154A	REFRIGERATION IN AIR CONDITIONING	2
APSM 154B	GAS & ELECTRIC HEATING	2
APSM 155C	MAINTAINING EFFICIENT OPERATION OF ELECTRIC COOLING & HEATING EQUIPMENT	2
APSM 156A	HEAT PUMP EFFICIENT OPERATION & SERVICE	2.5
APSM 156B	COOLING TOWERS, PUMPS & PIPING	2.5
APSM 156C	CHILLED WATER HVAC SYSTEMS & COMPONENTS	2.5
APSM 157A	PLANS & SPECIFICATIONS FOR THE SERVICE TECHNICIAN	2.5
APSM 158A	INTRODUCTION TO DIRECT DIGITAL HVAC CONTROLS	2
APSM 158C	INVERTER, VRF & HEAT RECOVERY TECHNOLOGY	2.5
Support Courses		
Select 12 courses from the following:		26.5-29
APSM 151C	HEAT, MATTER & ENERGY IN HVAC SYSTEMS	
APSM 152B	CHARGING REFRIGERANT SYSTEMS	
APSM 153C	COMPONENTS OF THE REFRIGERANT CYCLE	
APSM 173B	TEMPERATURE MEASUREMENTS, DUCT SYSTEMS & BASIC CONTROLS	
APSM 173C	HVAC FANS, FAN LAWS & V-BELT DRIVES	
APSM 174A	HYDRONIC SYSTEMS, PUMPS & HYDRONIC BALANCING	
APSM 174B	BALANCING DOCUMENTATION, COOLING TOWERS & TAB RELATED SKILLS	
APSM 174C	FIRE LIFE SAFETY LEVEL 1	
APSM 177A	TITLE 24 MECHANICAL ACCEPTANCE TESTING	
APSM 177B	ADVANCED DDC CONTROLS/COMMISSIONING OF HVAC SYSTEMS	
APSM 177C	ENERGY AUDITING	
APSM 178A	INDOOR AIR QUALITY	
APSM 178B	GREEN CONSTRUCTION & LEED CERTIFICATION FOR HVAC	
APSM 178C	FOREMAN TRAINING/PROJECT MANAGEMENT FOR HVAC	
APSM 180B	BUILDING AUTOMATION & CONTROLS 2	
APSM 181B	BUILDING AUTOMATION & CONTROLS 5	
APSM 181C	BUILDING AUTOMATION & CONTROLS 6	
Total Units		58.5-61

Note: Additionally, students who complete the core and support courses will satisfy Foothill GE Area 1B, Oral Communication and Critical Thinking; Area 2, Mathematical Concepts and Quantitative Reasoning; Area 4, Social and Behavioral Sciences; Area 5, Natural Sciences (with Laboratory); and Area 7, Lifelong Learning.

Certificate Requirements

Certificate of Achievement in Air Conditioning Mechanic

• Units: 58.5-61

The certificate of achievement is awarded upon completion of the core and support courses. General education courses are not required.

Currently offered at: Bay Area Sheet Metal JAC.