

APPRENTICESHIP: PIPE TRADES, SHEET METAL, FIELD IRONWORKERS (APPR)

APPR 150 • JOB SAFETY, OSHA, MATHEMATICS, HERITAGE & RIGGING I

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing/Pipefitting/Refrigeration/HVAC Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

First course of the Plumber & Pipefitter Apprenticeship Program. Provides students with a working knowledge of mathematics, plumbing industry materials and standards (as they apply to the plumbing industry), use and care of Pipe Trade tools, practice safety, rigging, and a review of Heritage of the United Association.

APPR 151 • OXY-ACC, ARC & PLASTIC WELDING, SOLDERING/BRAZING

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing/Pipefitting/Refrigeration/HVAC Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Second-year course of the Plumber & Pipefitter Apprenticeship Program. The course will provide students with a working knowledge of welding principles, as they relate to oxygen/acetylene burning, brazing, soldering and welding. The Apprentice Plumber is a 5-year certificate program. No certification for welding provided in this course.

APPR 154 • GAS & WATER SUPPLY

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Third-year course of the Plumber & Pipefitting Apprentice Program. Provides the student with a working knowledge of the supply and treatment of potable water, as well as the design and construction of potable water conveyance systems. This course also offers instruction in the use of natural gas and liquid propane gas systems as they apply to the piping industry.

APPR 157 • STEAMFITTING & PIPEFITTING

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Fourth-year course of the Plumbing and Pipefitting Apprenticeship Program. Provides students with a working knowledge of the design, layout, components, specific safety hazards and accepted engineering practices associated with steam heating, hydronic heating and cooling systems.

APPR 160A • HVAC TECH, CUSTOMER SERVICE

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

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

APPR 161 • AIR CONDITIONING, PNEUMATIC CONTROLS, INSTRUMENTATION & PROCESS CONTROLS

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Third-year course of the Plumber, Pipefitter & Service Tech Apprenticeship Program. Reviews the theory and application of related math and science as well as the vapor compression cycle and refrigeration components and systems.

APPR 162C • ELECTRONIC CONTROLS, DDC CONTROLS

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Refrigeration & Air Conditioning Apprenticeship Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Fourth-year course of the HVACR Apprenticeship Program. Provides a working knowledge of direct digital control systems and the electronics involved with these systems as they apply to comfort air and building control management.

APPR 166 • JOB SUPERVISION

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing/Pipefitting Apprentice Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Provides students with the knowledge and skills to properly supervise, schedule and document a construction project. No certification in job supervision is provided.

APPR 167 • START, TEST & BALANCE

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Fifth-year course of the Plumber & Pipefitter Apprenticeship Program. Provides students with a working knowledge of the start, test, and balance of HVACR equipment and systems.

APPR 168 • SUPERMARKET REFRIGERATION

Units:	5
Hours:	37 lecture, 86 laboratory per quarter (123 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Plumbing & Pipefitting Apprenticeship Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Second-year course of the Plumber, Pipefitter & Service Technician Apprenticeship Program. Provides the student with a working knowledge of the fundamentals of oil return and oil separators, electric and hot gas exhaust, multi-stage compressor systems and pump down systems.

APPR 183A • BASIC ELECTRICITY FOR SHEET METAL & AIR CONDITIONING SERVICE

Units:	4.5
Hours:	30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Development of basic skills necessary for sheet metal workers to service air conditioning equipment with special emphasis on the basics of electricity and refrigeration principles.

APPR 183B • ADVANCED ELECTRICITY FOR SHEET METAL & AIR CONDITIONING SERVICE

Units:	4.5
Hours:	30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Continued development of skills necessary for sheet metal workers to service air conditioning equipment with special emphasis on the use of basic electrical testing instruments, principles, transformers, relays, contacts and safety around electrical equipment.

APPR 184A • AIR CONDITIONING; COMMERCIAL SYSTEMS; HEATING (FOURTH-YEAR SERVICE)

Units:	4.5
Hours:	30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.
Degree and Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Development of skills necessary for sheet metal workers to service air conditioning equipment with emphasis on air-cooled commercial systems, refrigerant line components, installation and commercial applications.

APPR 184B • COMMERCIAL SYSTEMS; HEAT LOADS; PIPING (FOURTH-YEAR SERVICE)

Units: 4.5
Hours: 30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Continued development of skills necessary for sheet metal workers to service air conditioning equipment with emphasis on commercial systems, servicing, heat loads and piping.

APPR 185A • BASIC REFRIGERATION FOR SHEET METAL AIR CONDITIONING SERVICE

Units: 4.5
Hours: 30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Introduction to the use of refrigeration evacuation service equipment, charging refrigeration systems, and to the use of oxy-acetylene brazing equipment.

APPR 185B • ADVANCED REFRIGERATION FOR SHEET METAL AIR CONDITIONING SERVICE

Units: 4.5
Hours: 30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Continued development of refrigeration skills with emphasis on the function of compressors, multiphase electric motors and piping systems.

APPR 186A • PROPERTIES OF AIR DISTRIBUTION FOR SHEET METAL AIR CONDITIONING SERVICE

Units: 4.5
Hours: 30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Introduction to the different properties of air distribution with air volumes, pressures, humidity and temperature; basic air balance procedures.

APPR 186B • REFRIGERATION THEORY FOR SHEET METAL AIR CONDITIONING SERVICE

Units: 4.5
Hours: 30 lecture, 78 laboratory per quarter (108 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal-Air Conditioning Service Mechanic Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Continuing refrigeration theory with emphasis on all the major parts of refrigeration systems. The explanation of the principles and function of the heat pump in a residential application.

APPR 188A • ORIENTATION; SAFETY & BEGINNING RESIDENTIAL SHEET METAL INSTALLATION (SPECIALIST 1A)

Units: 1.5
Hours: 6 lecture, 48 laboratory per quarter (54 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Specialist Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

An introduction to residential and light commercial sheet metal installation, safety, tools, materials, equipment and related industry practices. Emphasis will be on safety and soldering techniques.

APPR 188B • RESIDENTIAL COMPONENTS IDENTIFICATION & INSTALLATION (SPECIALIST 1B)

Units: 1.5
Hours: 6 lecture, 48 laboratory per quarter (54 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Specialist Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

Continued development of concepts and practices already introduced and used in residential and light commercial installations of sheet metal ductwork. Emphasis will be on materials information and skills development.

APPR 189A • RESIDENTIAL SYSTEMS; DUCT & HVAC SYSTEMS (SPECIALIST 2A)

Units: 1.5
Hours: 6 lecture, 48 laboratory per quarter (54 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Specialist Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Foothill GE: Non-GE
Transferable: None
Grade Type: Letter Grade (Request for Pass/No Pass)
Repeatability: Not Repeatable

A study of typical residential sheet metal flashing, waterproofing, ventilation and HVAC systems. Development of installation techniques.

APPR 189B • PLANS & ARCHITECTURAL APPLICATIONS FOR RESIDENTIAL SHEET METAL (SPECIALIST 2B)

Units: 1.5
Hours: 6 lecture, 48 laboratory per quarter (54 total per quarter)
Prerequisite: Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Specialist Apprenticeship Program.

Degree and Credit Status: Degree-Applicable Credit Course

Status:

Foothill GE: Non-GE

Transferable: None

Grade Type: Letter Grade (Request for Pass/No Pass)

Repeatability: Not Repeatable

An advanced study of industry standards, values and requirements in residential sheet metal work, including architectural applications of metal roofing, complex flashing, gutter and downspouts. Use of plans for coordinating installations. Mathematics review and further development of soldering skills.