

Plumbing Apprenticeship Program Curriculum

Plumbing Level One

02101-05 Introduction to the Plumbing Profession (5 Hours)

Introduces the trainee to plumbing, starting with the history of plumbing from ancient times to current plumbing training programs. Also covers professional practices, career opportunities, and some basic safety information.

02102-05 Plumbing Safety (20 Hours)

Discusses the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. Reviews the types and proper use of personal protective equipment (PPE). Instructs trainees in the use of critical safety information conveyed in hazard communication (HazCom), safety signs, signals, lockout/tagout, and emergency response. Covers confined space safety, and reviews safety issues related to hand and power tools.

02103-05 Plumbing Tools (7.5 Hours)

Covers the tools that plumbers use in their daily work and need in their toolboxes, including measuring tools, leveling tools, wrenches, pliers, hammers, screwdrivers, vises, saws, pipe cutters, drills, threaders, and soldering equipment.

02104-05 Introduction to Plumbing Math (7.5 Hours)

Reviews basic math principles and then moves on to plumbing-specific math problems, including calculating pipe lengths, runs, and offsets for 45-degree angles.

02105-05 Introduction to Plumbing Drawings (12.5 Hours)

Reviews the blueprints that are included in a building's plans and then moves on to specific plumbing drawings, such as isometric and oblique pictorial drawings, orthographic drawings, and schematic drawings. Also covers drawings of fixtures, assembly drawings, and cutaway drawings.

02106-05 Plastic Pipe and Fittings (10 Hours)

Describes the various types of plastic piping and fittings; what each is used for; and the measuring, cutting, and joining techniques for each type. Also covers the hangers and supports used with plastic pipe.

02107-05 Copper Pipe and Fittings (10 Hours)

Describes the various types of copper piping and fittings; what each is used for; and the measuring, cutting, and joining techniques for each type. Also covers the hangers and supports used with copper pipe.

02108-05 Cast-Iron Pipe and Fittings (12.5 Hours)

Describes the two types of cast-iron pipe (hub and no-hub); what fittings are used with each; and how each is measured, cut, joined, and assembled. Also covers the hangers and supports used with cast-iron pipe.

02109-05 Carbon Steel Pipe and Fittings (10 Hours)

Describes carbon steel pipe; fittings used with it; and how it is measured, cut, threaded, joined, and assembled. Also covers the hangers and supports used with carbon steel pipe.

02110-05 Corrugated Stainless Steel Tubing (2.5 Hours)

Reviews flexible plastic-coated steel tubing. Discusses piping system components and the various connection and installation options. Also reviews applicable safety and code requirements.

02111-05 Fixtures and Faucets (5 Hours)

Covers various types of fixtures that plumbers install, including sinks and lavatories, bathtubs and showers, water closets and urinals, garbage disposals and dishwashers, and laundry trays and mop basins. Also covers compression and noncompression faucets for sinks and lavatories.

02112-05 Introduction to Drain, Waste, and Vent (DWV) Systems (10 Hours)

Provides an overview of the drain, waste, and vent (DWV) system from inside the building, where the liquid drains into pipes, to the sewer and waste treatment facilities. Covers the basics of traps, drains, vents, DWV fittings, and cleanouts.

02113-05 Introduction to Water Distribution Systems (10 Hours)

Provides an overview of the water distribution system from its source - a municipal water system or a private well - to water treatment and distribution. Also covers the water distribution system within buildings as well as the basics of valves, fixtures, and faucets.

Plumbing Level Two

02201-05 Plumbing Math (15 Hours)

Explains the Pythagorean theorem and reviews methods for finding angles. Discusses the techniques used to calculate simple and rolling offsets, as well as offsets on parallel runs of pipe.

02202-05 Reading Commercial Drawings (20 Hours)

Teaches trainees how to interpret and use civil, architectural, structural, mechanical, plumbing, and electrical drawings when installing plumbing systems. Covers how to create and use isometric drawings, material takeoffs, and approved submittal data.

02203-05 Hangers, Supports, Structural Penetrations, and Fire Stopping (10 Hours)

Introduces trainees to methods for attaching and running DWV and water supply piping in relation to structural elements, including pipe hangers and supports, modifications to structural members, and fire-stopping.

02204-05 Installing and Testing DWV Piping (25 Hours)

Explains how to locate, install, connect, and test a complete drain, waste, and vent (DWV) system.

02205-05 Installing Roof, Floor, and Area Drains (5 Hours)

Covers the proper techniques for locating, installing, and connecting roof, floor, and area drains according to code. Also discusses waterproof membranes and flashing, drain components, and proper drain applications.

02206-05 Types of Valves (5 Hours)

Reviews the many types and uses of valves and introduces trainees to valve repair and replacement.

02207-05 Installing and Testing Water Supply Piping (20 Hours)

Explores the proper techniques for locating, installing, and testing complete water supply systems, including piping, meters, water heaters, water softeners, and hose bibs. Reviews common code requirements for water supply systems.

02208-05 Installing Fixtures, Valves, and Faucets (20 Hours)

Covers the installation of basic plumbing fixtures, including bathtubs, shower stalls, lavatories, sinks, water closets, and urinals. Also reviews the installation of associated valves, faucets, and components.

02209-05 Introduction to Electricity (15 Hours)

Introduces trainees to the principles of electricity including voltage, current, resistance, and power. Includes important electrical formulas, circuitry, and common plumbing-related electrical applications.

02210-05 Installing Water Heaters (5 Hours)

Discusses gas-fired, electric, solar, instantaneous, and indirect water heaters, components, and applications. Reviews proper installation and testing techniques and covers the latest federal guidelines that apply to water heaters.

02211-05 Fuel Gas Systems (20 Hours)

Introduces the techniques for safe handling of natural gas, liquefied petroleum gas, and fuel oil. Reviews fuel gas and fuel oil applications, systems installation, and testing.

02212-05 Servicing of Fixtures, Valves, and Faucets (5 Hours)

Covers the troubleshooting and repair of fixtures, valves, and faucets in accordance with safety guidelines.

Plumbing Level Three

02301-06 Applied Math (17.5 Hours)

Introduces trainees to math concepts they will use on the job, including weights and measures, area and volume, temperature, pressure, and force. Also reviews the six simple machines: inclined planes, levers, pulleys, wedges, screws, and wheels and axles.

02302-06 Sizing Water Supply Piping (17.5 Hours)

Teaches techniques for sizing water supply systems, including calculating system requirements and demand, developed lengths, and pressure drops. Also reviews the factors that can reduce efficiency of water supply piping.

02303-06 Potable Water Treatment (15 Hours)

Explains how to disinfect, filter and soften water supply systems. Discusses how to troubleshoot water supply problems, flush out visible contaminants from a plumbing system, and disinfect a potable water plumbing system.

02304-06 Backflow Preventers (20 Hours)

Introduces the different types of backflow prevention devices and discusses how they work, where they are used, and how they are installed.

02305-06 Types of Venting (20 Hours)

Reviews the different types of vents that can be installed in a SWV system and how they work. Also teaches design and installation techniques.

02306-06 Sizing DWV and Storm Systems (20 Hours)

Explains how to calculate drainage fixture units for waste systems. Reviews how to size drain, waste, and vent (DWV) systems, storm drainage systems, and roof storage and drainage systems.

02307-06 Sewage Pumps and Sump Pumps (17.5 Hours)

Discusses the installation, diagnosis and repair of pumps, controls, and sumps in sewage and storm water removal systems.

02308-06 Corrosive-Resistant Waste Piping (17.5 Hours)

Discusses corrosive wastes and reviews related safety issues and hazard communications. Discusses how to determine when corrosive resistant waste piping needs to be installed, as well as how to correctly select and properly connect different types of piping.

02309-06 Compressed Air (10 Hours)

Explains the principles of compressed air systems and describes their components and accessories. Reviews installation and periodic servicing of air compressor systems.

Plumbing Level Four

02401-02 Business Math for Plumbers (10 Hours)

Introduces trainees to concepts and practices that are essential for competitive, successful plumbing businesses. Covers basic business accounting and project estimating, as well as techniques for cost control and task organization.

02402-02 Sizing DWV and Storm Systems (15 Hours)

Explains how to calculate drainage fixture units for waste systems. Reviews how to size drain, waste, and vent (DWV) systems; storm drainage systems; and roof storage and drainage systems.

02403-02 Private Water Supply Systems (12.5 Hours)

Explains the operation of pumps and well components. Reviews the qualities of good wells and how to assemble and disassemble pumps and components.

02404-02 Private Waste Disposal Systems (12.5 Hours)

Describes the types of private sewage systems, discusses the maintenance and replacement of these systems, and explains how to determine the local code requirements for these systems. Covers percolation tests and sewage system planning and layout.

02405-02 Locating Buried Water and Sewer Lines (12.5 Hours)

Discusses techniques to locate water lines, metallic pipe, and nonmetallic pipe. Reviews how to read plans and blueprints, use electronic pipe locators, and calculate grade differences.

02406-02 Hydronic and Solar Heating Systems (15 Hours)

Introduces the basic types of hydronic and solar heating systems and their components. Reviews hydronic and solar heating system layout and installation. Also discusses methods for inhibiting corrosion in solar heating systems.

02407-02 Water Supply Treatment (25 Hours)

Explains how to disinfect, filter, and soften water supply systems. Discusses how to troubleshoot water supply problems, flush out visible contaminants from a plumbing system, and disinfect a potable water plumbing system.

02408-02 Swimming Pools and Hot Tubs (15 Hours)

Introduces trainees to plumbing systems in swimming pools, hot tubs, and spas. Trainees will learn how to install and troubleshoot water supply systems and drains.

02409-02 Compressed Air (10 Hours)

Explains the principles of compressed air systems and how to install their components and accessories. Reviews how to determine friction loss in a compressed air piping system and how to troubleshoot and install air lines on air compressor systems.

02410-02 Corrosive-Resistant Waste Piping (12.5 Hours)

Discusses corrosive wastes and reviews related safety issues and hazard communications. Discusses how to determine when corrosive resistant waste piping needs to be installed, as well as how to correctly select and properly connect different types of piping.

02411-02 Plumbing for Mobile Homes and Mobile Home Parks (10 Hours)

Describes the location and layout of plumbing systems for mobile home and travel trailer parks. Reviews how to design and lay out a system, how to connect water and sewer lines to a mobile home, and how to estimate materials and costs for the park.