

Plumber: Program Outline

Program Goal

To provide students with comprehensive and modern training to begin a career in plumbing. Students learn how to read blueprints and select and install piping and plumbing fixtures, as well as the basic codes, regulations, and standards that plumbers encounter.

Program Outcomes	Courses	Evidence of Learning
Recognize basics of the construction industry: the trades that compose it, tasks performed, skills needed, and its safe work practices	CRP010: Introduction to Construction and Building Trades	Multiple-choice lesson exams
Consider the skills for using plumbing tools and the legal requirements for meeting inspections	PLM020: Introduction to Plumbing and Pipe Fitting	Multiple-choice lesson exams
Analyze the tools and skills used for the installation, maintenance, and repair of plumbing and heating systems	PLM030: Fundamentals of Plumbing	Multiple-choice lesson exams
Organize plumbing responsibilities into appropriate stages for optimal workflow and effective design, installation, and maintenance	PLM040: Modern Plumbing	Multiple-choice lesson exams
Solve real-world problems by calculating accurate pipe lengths	PLM030: Fundamentals of Plumbing	Multiple-choice lesson exams
	PLM050: Math for Plumbers	Multiple-choice lesson exams
Solve inefficient systems by installing, maintaining, and repairing plumbing fixtures	PLM060: Finish Plumbing	Multiple-choice lesson exams, graded project
Explain the fundamentals of drawings and blueprints and the assembly of piping and accessories	PLM070: Reading Piping Prints	Multiple-choice lesson exams

Program Structure

SYP110: Starting Your Program

Lesson 1 Starting Your Program

CRP010: Introduction to Construction and Building Trades

Lesson 2 Construction and Building Trades

PLM020: Introduction to Plumbing and Pipe Fitting

Lesson 3 The Trades of Plumbing and Pipe Fitting

Lesson 4 Plumbing and Pipe-Fitting Tools

PLM030: Fundamentals of Plumbing

Lesson 5 Safety and Using Tools in Plumbing

Lesson 6 Introduction to Plumbing Processes

Lesson 7 Water Supply and Fixtures

Lesson 8 Fittings, Valves, and Heaters

Textbook *Modern Plumbing*

PLM040: Modern Plumbing

Lesson 9 Plumbing Systems

Lesson 10 Installing Plumbing Systems

Lesson 11 Special Plumbing Installations

Lesson 12 Plumbing Services

PLM050: Math for Plumbers

Lesson 13 Math Essentials

Lesson 14 Math in the Piping Industry

PLM060: Finish Plumbing

Lesson 15 Plumbing Tools and Materials

Lesson 16 Installing Plumbing Lines and Common Fixtures and Faucets

Lesson 17 Installing More Fixtures, Faucets, and Drains

Lesson 18 Plumbing Repairs

Lesson 19 Finish Plumbing Graded Project

Textbook *Black & Decker: The Complete Guide to Plumbing*

PLM070: Reading Piping Prints

Lesson 20 Drawings for Plumbing

Course Descriptions and Objectives

SYP102: Starting Your Program

In this course, you'll develop the necessary skills to ensure your success in the program. Starting Your Program is designed to help you make a smooth transition to Penn Foster, including learning how to use all the tools and resources that are available to you, get help when you need it, understand the Code of Conduct, and improve your study skills and time management. The goal is to help you become a confident, independent learner.

By the end of this course, you'll be able to:

- Identify skills needed to be a confident and independent online learner

CRP010: Introduction to Construction and Building Trades

This course introduces you to the various domains of the construction industry: carpentry, HVAC, plumbing, roofing, drywall work, general maintenance, and so on. You'll learn about the differences between construction and building trades and residential and commercial construction. The duties and tasks of the construction and building trades professional are also explained in this course. Finally, you'll learn about the proper safety measures required in various areas of the construction industry. Securing a safe environment is crucial to ensuring individual workers' safety.

By the end of this course, you'll be able to:

- Analyze the structure of work, safety measures, and fundamentals of the construction industry and building trades

PLM020: Introduction to Plumbing and Pipe Fitting

Plumbers and pipe fitters work on piping systems that people rely on every day for sanitation and comfort. Piping systems provide buildings with fresh water and remove wastewater from these structures. Other systems carry gas or steam to power equipment or supply energy. You'll identify the different features and purposes of these systems. For any system, all piping workers must follow state and local codes when installing or servicing any system. You'll examine the types of construction drawings that each trades worker needs to read and interpret correctly. Because safety is essential in the piping trades, you'll study the best work practices for using common construction tools and specialized piping tools.

By the end of this course, you'll be able to:

- Analyze the piping trades' responsibilities and guiding procedures
- Categorize the types of plumbing and pipe-fitting tools and the safety practices for each

PLM030: Fundamentals of Plumbing

This course covers the basic fundamental principles you'll need to build a solid foundation as a plumber. This course starts with an introduction to safety, common plumbing tools and leveling instruments, and basic mathematics involved on the job. You'll learn about certain aspects of plumbing work that come along with maintaining and installing different plumbing systems, including topics like hydraulics and pneumatics; how to rig and hoist using ropes and knots; and the procedures and equipment used in solder, brazing, welding, and excavating. Water supply and treatment, fixtures, and different piping materials and plumbing are also core components of the knowledge you'll need to be a professional

plumber.

By the end of this course, you'll be able to:

- Analyze the structure of the plumbing process, the safety measures involved, and the associated tools
- Categorize the various domains, codes, and responsibilities linked with plumbing
- Distinguish between the water supply fixtures and their materials that reduce water contamination
- Differentiate between then types of fittings, valves and heaters, and their installation methods

PLM040: Modern Plumbing

In this course, you'll look at all the phases of plumbing systems that plumbers work with, from design and installation to repairs and remodeling. As a plumber, any jobs you take will revolve around pipes and fixtures. Your work will start with the planning and design of pipes and plumbing systems. Proper design that's up to code and well-planned ensures the installation process can run smoothly. As a plumber, you'll work with people across different trades areas in the design process, but once it's time for pipe installation, it's your responsibility to make sure all the appropriate measurements are taken, all the right materials are used, and that everything is done to code. This includes common DWV and water supply systems, but also special systems like pools, spas, or irrigation systems. Another big part of the job is making repairs and assisting in remodeling work.

By the end of this course, you'll be able to:

- Explain the phases and procedures involved in the design and installation of plumbing systems
- Summarize the installation procedures related to water supply system, DWV piping, fixtures, faucets, and appliances
- Explain the role of the plumber in the installation and maintenance of special plumbing installations
- Analyze common plumbing system issues to correctly diagnose, troubleshoot, and repair problems during service and remodeling jobs

PLM050: Math for Plumbers

As a plumber, you'll install pipes in settings that will require you to make precise calculations before cutting and installing the pipes. You'll use math to measure, cut, and place pipes appropriately. On the job, you'll apply math with basic fractions, as well as math with trigonometric principles. Although some topics are challenging, you can prepare for success as a plumber by mastering these skills that you'll apply every day.

By the end of this course, you'll be able to:

- Develop math skills for work in the piping trades
- Produce calculations to cut and install pipe accurately

PLM060: Finish Plumbing

Finish plumbing refers to the connections made between pipes and fixtures or appliances. Typically plumbing projects involved with finish plumbing includes isolating the plumbing behind walls or under floors. In this case, access panels are created to make the shut off valves accessible for future maintenance and repairs. Plumbing projects range from common repairs such as a leaky faucet to more complex repairs such as a water heaters and installations including

fixtures and drains. You'll notice projects also vary depending on if the project is a renovation or new installation.

By the end of this course, you'll be able to:

- Distinguish between various types of plumbing tools, materials, and their use
- Explain the installing and design process of plumbing lines, fixtures, and faucets
- Explain the installing and design process for other fixtures, faucets, and drains
- Analyze various types of plumbing repairs related to home plumbing
- Organize the steps for installing a double bowl, self-rimming kitchen sink with a pullout faucet and the sink drain

PLM070: Reading Piping Prints

As a plumber, you'll need to know the fundamentals of reading piping prints. It's important to know that prints serve a purpose and are necessary for the layout of plumbing systems. There are different processes for creating prints. You'll need to know the different types of drawings, symbols, abbreviations, and dimensions that are used in laying out a good plumbing system. Also, as a plumber, you'll need to know the different types of valves, pipe materials, and their manufacturing methods.

By the end of this course, you'll be able to:

- Interpret the components of piping prints needed for various plumbing designs

Note: The titles of your learning materials may be different from those listed on your program outline. There is no need to call your instructor about these differences. While the titles of certain learning materials may differ, the educational content is the same. All learning materials are designed to give you the finest education in your field. If you need instructional assistance, however, be sure to call for help. We reserve the right to revise the program of study and the instructional materials and to substitute for the items of equipment offered.