Plumber
A Guide to Course Content

Plumbers install, replace and maintain water and sewage systems, and hydronic heating systems in residential, commercial and industrial buildings. They may also be licensed to perform gasfitting work.

Training Requirements: To graduate from each level of the apprenticeship program, an apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year. Total trade time required is 7200 hours and at least 4 years in the trade.

There are four levels of technical training delivered by Saskatchewan Polytechnic in Saskatoon. Level One and Two are also offered at Saskatchewan Polytechnic in Regina:

- Level One: 8 weeks
- Level Two: 8 weeks
- Level Three: 7 weeks
- Level Four: 7 weeks

*Any person who is not a journeyperson plumber must become registered as an apprentice to work in this trade.

The information contained in this pamphlet serves as a guide for employers and apprentices. The pamphlet briefly summarizes the training delivered at each level of apprenticeship training. An apprentice spends approximately 15% of the apprenticeship term in a technical training institute learning the technical and theoretical aspects of the trade. The hours and percentages of technical and practical training may vary according to class needs and progress.

The content of the technical training components is subject to change without notice.
Level One - 8 weeks

Safety and Rigging
- safe work practices
- hoisting and rigging equipment
- crane hand signals
- knots and hitches
- WHMIS awareness

Basic Tools and Materials
- hand and power tools
- piping materials
- pipe fittings and valves
- pipe joining
- hanging and supporting pipe
- solder and flux

Gasfitting
- appliance and equipment applications for natural and propane gases
- properties of natural gas, propane and butane
- code regulations – B149.1 and B149.2
- natural gas piping system sizing
- gas distribution system pressure testing

Hydronic Heating
- properties of water
- hydronic heating and cooling
- boilers and boiler components
- circulating pumps
- zoning
- piping layouts

Blueprint Reading and Plumbing Code
- basic drafting
- symbols, lines and abbreviations
- orthographic and section views
- plumbing code

Trade Mathematics
- whole numbers, fractions, decimals and percents
- basic algebra to solve trade related problems
- measurement systems
- plumbing trade related calculations

Trade Science
- structure and properties of matter
- thermal expansion
- chemical reactions
- thermodynamics
- problems involving simple machines

Level Two - 8 weeks

Domestic Piping Systems
- piping materials
- fixtures
- plumbing code
- testing procedures
- domestic water pipe sizing
- rough-in, installation and trim for domestic fixtures

**Pumps and Hydronic Heating**
- water sources
- components of a potable water system
- pump theory
- rural water supply systems
- radiant panel heating systems
- piping and controls for radiant panel heating systems
- boiler piping design

**Gasfitting**
- gas piping system sizing up to and including 2 psig
- combustion process for natural gas and propane appliances and equipment
- mathematical concepts for gas sciences
- code regulations – B149.1 and B149.2
- gas burners
- control components for appliances
- domestic appliance installation
- domestic appliance start-up procedures

**Blueprint Reading and Plumbing Code**
- plumbing code for DWV
- orthographic and isometric projections
- blueprints and specifications
- DWV plumbing drawings

**Trade Mathematics**
- basic trade math and algebra
- measurement conversions
- geometric plumbing trade calculations
- algebraic plumbing trade calculations

**Trade Science**
- properties and classifications of matter
- problems involving density, specific gravity and buoyancy
- problems involving pressure of liquids and gases
- problems involving fluid dynamics

**Basic Electrical**
- basic electrical concepts
- electrical test equipment
- ladder and wiring diagrams
- testing standing pilot appliances
- terminations

**Level Three - 7 weeks**

**Commercial Piping Systems**
- plumbing code
- commercial plumbing fixtures and accessories
- cross connection control
- flushometers and metering valves
• interceptors
• commercial potable hot water systems
• water meters
• potable water distribution system sizing

Private Sewage Disposal Systems
• Saskatchewan Onsite Wastewater Guide and Municipal requirements
• site evaluation and environmental impact requirements
• rural wastewater onsite disposal systems
• disposal systems components
• soil types and disposal systems

Gasfitting
• gas piping system sizing up to and including 20 psig
• air supply for natural and propane gas appliances
• flue loss and draft characteristics
• code requirements for combustion air supply for inputs of 400 MBH or less
• code requirements for removal of by-products of combustion
• venting for Category I appliances
• electrical controls systems for domestic gas appliances

Blueprint Reading and Plumbing Code
• plumbing code for drainage and venting
• interpret code for sanitary drainage, storm drainage and venting
• grade and elevation
• isometric and non-isometric lines
• isometric drawings
• DWV systems

Trade Mathematics
• units of measurement
• perimeter, area and volume
• plumbing trade calculations

Basic Electrical
• testing electrical circuits
• operation of electrical switches
• electrical transformers
• relays in electrical circuits
• AC motors

Level Four - 7 weeks

Special Piping Systems
• medical gas code
• plastic welding
• specialty tools
• potable water distribution system sizing
• potable water distribution piping and components
• specialty piping systems and components
• residential fire suppression systems

Pumps and Private Water Supply
• sources of water supply
• types of pumps and accessories
• pump sciences
• well intakes
• pump sizing
• tank sizing
• pump maintenance and troubleshooting

Gasfitting
• flue gas analysis
• electrical controls systems for domestic gas fired appliances
• liquefied petroleum containers
• domestic applications pertaining to the B149.3 Gas Code

Hydronic Heating
• boiler ratings
• high pressure and low pressure boilers
• low pressure hydronic boiler trim components
• circulator requirements
• closed loop systems
• hydronic heating and cooling distribution piping

Water Conditioning and Backflow
• constituents of water
• water tests
• water treatment devices
• water treatment equipment sizing
• component installation

Blueprint Reading and Plumbing Code
• plumbing code for drainage, waste and venting
• interpret code for sanitary drainage, storm drainage and venting
• establish elevation with a builder’s level
• establish elevation with a laser level
• isometric and orthographic views
• plumbing systems
• grid lines

Trade Mathematics
• basic math skills
• units of measurement
• offset calculations
• grade calculations
• heat calculations
• plumbing trade related calculations

Basic Electrical
• troubleshoot electrical controls for a standing pilot appliance
• troubleshoot electrical controls for a direct spark or hot surface ignited appliance
• ladder and connection diagrams
• electrical pump controls