



**BETHLEHEM AREA VOCATIONAL-TECHNICAL
SCHOOL**
3300 CHESTER AVENUE BETHLEHEM PA 18020

Plumbing

Mr. Michael Giamoni

610-866-8013 ext. 162 giamonim@bavts.org

46.0503 Plumbing

Course Description:

Plumbers install and repair pipe systems that carry water, steam, or other liquids or gases. Plumbers install heating and cooling equipment, plumbing fixtures, and appliances. Some Plumbers install water, gas, and waste disposal systems. Others install complex pipe systems used in oil refineries and nuclear plants. They use torches, wrenches, drills, saws, welders and many other kinds of tools and equipment. Both Plumbers and Pipefitters need good basic math skills, working with fractions and using formulas. Plumbers also need good communication skills and the ability to read and interpret blueprints.

Students will learn to assemble, install, alter and repair pipe systems which carry water, steam or other liquids or gases for residential, commercial, and industrial uses. They will install plumbing fixtures, appliances and hydronic systems. Along with communication skills students learn how to read blueprints and calculate pipefitting formulas. Students will use acetylene torches and a variety of hand and power tools to accomplish over 200 real world tasks. At the end of the program, a student's job readiness and occupational skills will be measured based on testing and standards of the National Occupational Competency Testing Institute (NOCTI).

Careers in Plumbing:

Unskilled: Laborer

Semi-Skilled: Apprentice, Supply clerk, Parts Delivery

Skilled: Plumber, Pipefitter, Gas fitter, Water Meter Installer, Water treatment specialist

Technician: Inspector, Master Plumber (6 year field based training required for license)

Professional: Instructor, Estimator, Engineer, Construction Manager

Average Annual Wage in the Lehigh Valley:

Plumbing Technology (CIP code 46.0503) has three areas listed as High Priority Occupations in the Lehigh Valley. The average annual wage in the Lehigh Valley for SOC codes related to this CIP are as follows:

Career and Technical Education Teachers, Secondary – \$65,540

First-Line Supervisors of Mechanics, Installers and Repairers - \$71,190

Parts Salespersons - \$45,350

Installation, Maintenance and Repair Workers - \$45,350

Solders and Brazers - \$43,350

Plumbers, Pipefitters and Steamfitters - \$54,360

Helpers, Pipelayers, Plumbers, Pipefitters and Steamfitters - \$35,290

Installation Workers - \$79,670

Septic Tank Servicers and Sewer Pipe Cleaners - \$45,520

Maintenance and Repair Workers, General - \$40,130

Resources:

Textbook: *Residential Construction Academy (RCA) "Plumbing"*

Grading for Class:

50% is Work Ethic, 25% Skill, 25% Knowledge

Classroom Tools:

Basic Hand Tools Associated with the Piping Trades

Basic Hand Held Power tools

Air Compressor

Multiple Styles of Power Threading Equipment

Multiple Styles of Power Pipe Assembly Tools

Multiple Styles of Power Drain Cleaning and Inspection Equipment

Certification:

OSHA Certification

TracPipe

GasTite

Course Syllabus Level 1

First Semester (First Marking Period)

Career Exploration:

Projects, Assignments & Assessments:

Classroom and school orientation and sign-off sheets (3) - Knowledge grade, 150 pts

Accurately Measure Worksheets (1) - Knowledge grade, 100 pts

Measure, Cut, Ream, Clean Copper Pipe – Skill grade, 100 pts

Assemble and Solder a Copper Joint with a Hand Held Torch - practice

Assemble and Solder Copper Square Project with a Hand Held Torch – Skill grade, 100 pts

Repair a Copper Square Project with a Hand Held Torch – Skill grade, 100 pts

Plumbing Technology – unit 38, 40, 41 – Knowledge grade, 300 pts

Assemble CPVC Square Project (2) - 1 practice, 1 Skill grade, 100 pts

Cut a Black Steel Nipple - Hand – Skill grade, 100 pts

Cut a Black Steel Nipple – Handheld Threader – Skill grade, 100 pts

Cut a Black Steel Nipple – Power Vise – Skill grade, 100 pts

Assemble a Black Steel Project – Skill grade, 100 pts

Assemble a PEX joint - Cinch Ring – Skill grade, 100 pts

Assemble a PEX project – Skill grade, 100 pts

Assemble a PEX joint -Expandable – Skill grade, 100 pts

Duty and Tasks Covered:

2400 Safety

2403 Perform daily work in a clean and organized manner

2500 Plumbing Trade Orientation

2519 Perform accurate measuring skills

2600 Steel Pipe

2601 Measure, cut, ream and thread steel pipe - hand

2602 Measure, cut, ream and thread steel pipe - hand power

2603 Measure, cut, ream and thread steel pipe - power vise

2604 Measure, cut, ream and thread a steel pipe project

2800 Copper Line

2802 Measure, cut, ream and clean copper pipe

2807 Assemble and solder a copper project - torch

2812 Repair a damaged copper pipe

2900 CPVC Lines

2901 Assemble and solvent weld a CPVC project

3100 PEX Lines

3103 Assemble a PEX expansion type joint

3105 Assemble a PEX cinch type joint

3107 Assemble a PEX project

Level 1 First Semester (Second Marking Period)

Basic Hand Tools:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Demonstrate End-to-End Measurements - Skill grade, 100 pts

Demonstrate Center-to-Center Measurements - Skill grade, 100 pts

Assemble a torch rig on a B-tank/MC-tank - Skill grade, 100 pts

Assemble and Solder Copper Square Project with a Hand Held Torch – Skill grade, 100 pts

Assemble CPVC Square Project - Skill grade, 100 pts

Adapt copper to other materials - Skill grade, 100 pts

Adapt CPVC to other materials - Skill grade, 100 pts

Cut PVC by Hand – Skill grade, 100 pts

Assemble a PVC Joint – Skill grade, 100 pts

Hang and Pitch PVC pipe – Skill grade, 100 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Chapter 1 Word Search – Knowledge grade, 25 pts

Read Chapter 1, *Plumber's Toolbox* in the RCA "Plumbing" Textbook

Chapter 1 Crossword – Knowledge grade, 50 pts

Answer Chapter 1 End of the Chapter Questions – Knowledge grade, 100 pts

Chapter 1 Open Book Review Test – Knowledge grade, 100 pts

Identify Hand tools - Skill grade, 100 pts

Chapter 1 Test – Knowledge grade, 100 pts

Construct a Résumé – PDP, 100 pts

Duty and Tasks Covered:

2400 Safety

- 2401 Participate in safety lessons
- 2402 Perform safety precautions necessary in daily plumbing work
- 2403 Perform daily work in a clean and organized manner

2500 Plumbing Trade Orientation

- 2501 Explain and performs basic job/employment skills
- 2502 Identify basic hand tools
- 2519 Perform accurate measuring skills

2800 Copper Lines

- 2801 Assemble a torch rig on a B-tank/MC-tank
- 2802 Measure, cut, ream and clean copper pipe
- 2810 Assemble and solder a copper project - torch

2900 CPVC Lines

- 2901 Assemble and solvent weld a CPVC project

3000 PVC Lines

- 3001 Cut PVC pipe square with a hand saw
- 3002 Solvent weld PVC pipe to a PVC fitting

3400 Plumbing rough-in installation

- 3405 Perform a water test on water lines
- 3414 Install a building drain with pitch

4400 Pipefitting

4401 Demonstrate end-to-end measurements

4402 Demonstrate center-to-center measurements

Level 1 Second Semester (Third Marking Period)

Power Tools:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Operate and Identify Components of a Screw Gun/Drill - Skill grade, 100 pts

Operate and Identify Components of a Reciprocating Saw - Skill grade, 100 pts

Operate and Identify Components of a Saber Saw - Skill grade, 100 pts

Operate and Identify Components of a Hammer Drill - Skill grade, 100 pts

Operate and Identify Components of a Powder Actuated Gun - Skill grade, 100 pts

Operate and Identify Components of an Air Compressor - Skill grade, 100 pts

Operate and Identify Components of a Portable Band Saw - Skill grade, 100 pts

Operate and Identify Components of a Hand Held Grinder - Skill grade, 100 pts

Operate and Identify Components of a Hole Hawg/Super Hole Hawg - Skill grade, 100 pts

Operate and Identify Components of a Right Angle Drill - Skill grade, 100 pts

Operate and Identify Components of a Circular Saw - Skill grade, 100 pts

Demonstrate testing of a GFCI receptacle - Skill grade, 100 pts

Install backing boards - Skill grade, 100 pts

Demonstrate proper wrapping of an extension cord - Skill grade, 100 pts

Perform safety precautions necessary in daily plumbing work - Skill grade, 100 pts

Demonstrate proper hole location for safe drilling of a TJI and a wood joist – Skill grade, 100 pts

Perform daily work in a clean and organized manner - Skill grade, 100 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report, Participate in safety lessons - Skill grade, 100 pts

Demonstrate advanced public speaking skills - Skill grade, 100 pts

Chapter 2 Word Search – Knowledge grade, 25 pts

Read Chapter 2, *Power Tools* in the RCA “Plumbing” Textbook

Chapter 2 Crossword – Knowledge grade, 50 pts

Answer Chapter 2 End of the Chapter Questions – Knowledge grade, 100 pts

Chapter 2 Open Book Review Test – Knowledge grade, 100 pts

Identify all Power tools - Skill grade, 100 pts

Chapter 2 Test – Knowledge grade, 100 pts

Duty and Tasks Covered:

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2500 Plumbing Trade Orientation

2502 Identify basic power tools

2503 Operate and identify components of a right angle drill

2504 Operate and identify components of a hole hawg/super hole hawg

2505 Operate and identify components of a hammer drill

2506 Operate and identify components of a reciprocation saw

2507 Operate and identify components of a circular saw

2508 Operate and identify components of saber saw

2509 Operate and identify components of a portable band saw

2510 Operate and identify components of a small hand held grinder

2511 Operate and identify components of a powder-actuated gun

2512 Operate and identify components of a portable air compressor

2513 Operate and identify components of a battery operated drill/screw gun

2519 Perform accurate measuring skills

2525 Demonstrate proper hole location for safe drilling of a TJI and a wood joist

2526 Demonstrate advanced public speaking skills

3400 Plumbing Rough-In installation

3402 Install backing boards

4300 Basic Electricity

4301 Demonstrate testing of a GFCI receptacle

4302 Demonstrate proper wrapping of an extension cord

Level 1 Second Semester (Fourth Marking Period)

Types of Pipe:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Cut PVC pipe square w/ hand saw and assemble to fitting with purple primer and glue - Skill grade, 100 pts

Assemble PVC project - Skill grade, 100 pts

Assemble a compression and flare project - Skill grade, 200 pts

Assemble a copper project with a torch - Skill grade, 100 pts

Assemble a copper project with the electric soldering equipment - Skill grade, 100 pts

Assemble a copper project with the Pro-Press equipment - Skill grade, 100 pts

Assemble and solder a copper project with an offset - Skill grade, 100 pts

Measure, cut, ream and thread steel pipe – hand - Skill grade, 100 pts

Measure, cut, ream and thread steel pipe – hand power - Skill grade, 100 pts

Measure, cut, ream and thread steel pipe – power vise - Skill grade, 100 pts

Measure, cut, ream and thread a steel project - Skill grade, 100 pts

Measure, cut, ream and thread steel project with an offset - Skill grade, 100 pts

Cut cast iron soil pipe with a chain ratchet cutter - Skill grade, 100 pts

Cut cast iron soil pipe with a scissor cutter - Skill grade, 100 pts

Cut cast iron soil pipe with a small right angle grinder - Skill grade, 100 pts

Assemble a No-HUB cast iron joint - Skill grade, 100 pts

Assemble a rubber gasket joint by hand - Skill grade, 100 pts

Assemble a rubber gasket joint using a puller - Skill grade, 100 pts

Adapt cast iron to PVC/copper by use of a furnco - Skill grade, 100 pts

Assemble and solvent weld a CPVC project - Skill grade, 100 pts

Adapt CPVC to other materials - Skill grade, 100 pts

Assemble and solvent weld a CPVC project with an offset - Skill grade, 100 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Chapter 3 Word Search – Knowledge grade, 25 pts

Read Chapter 3, *Types of Pipe* in the RCA “Plumbing” Textbook

Chapter 3 Crossword – Knowledge grade, 50 pts

Answer Chapter 3 End of the Chapter Questions – Knowledge grade, 100 pts

Chapter 3 Open Book Review Test – Knowledge grade, 100 pts

Identify all Power tools - Skill grade, 100 pts

Chapter 3 Test – Knowledge grade, 100 pts

Update Resume – Knowledge grade, 100 pts

Duty and Tasks Covered:

2400 Safety

- 2401 Participate in safety lessons
- 2402 Perform safety precautions necessary in daily plumbing work
- 2403 Perform daily work in a clean and organized manner

2500 Plumbing Trade Orientation

- 2515 Identify types of pipes
- 2521 Make a written material list

- 2522 Pull inventory from a written material list
- 2526 Demonstrate advanced public speaking skills

2600 Steel Pipe

- 2601 Measure, cut, ream and thread steel pipe - hand
- 2602 Measure, cut, ream and thread steel pipe – hand power
- 2603 Measure, cut, ream and thread steel pipe – power vise
- 2604 Measure, cut, ream and thread a steel project

2700 Cast Iron

- 2701 Cut cast iron soil pipe with a chain ratchet cutter
- 2702 Cut cast iron soil pipe with a scissor cutter
- 2703 Cut cast iron soil pipe with a small right angle grinder
- 2704 Assemble a No-HUB cast iron joint
- 2705 Assemble a rubber gasket joint by hand
- 2706 Assemble a rubber gasket joint using a puller
- 2707 Adapt cast iron to PVC/copper by use of a Furnco

2800 Copper Lines

- 2803 Assemble a flare joint – flaring tool
- 2804 Assemble a flare joint – hammer flare
- 2805 Assemble a compression joint
- 2806 Assemble a swaged joint
- 2807 Assemble and solder a copper project - torch
- 2808 Assemble and solder a copper project – electric
- 2809 Assemble and crimp a copper project – Pro-press

2813 Assemble and solder a copper project with an offset

2900 CPVC Lines

2903 Assemble and solvent weld a CPVC project with an offset

3000 PVC Lines

3001 Cut PVC pipe square with a hand saw

3002 Solvent weld PVC pipe to a PVC fitting

3004 Assemble a PVC project

3100 PEX Lines

3103 Assemble a PEX expansion type joint

3104 Disassemble a PEX expansion type joint

3105 Assemble a PEX cinch type joint

3106 Disassemble a PEX cinch type joint

3107 Assemble a PEX project

3200 Polyethylene pipe

3201 Assemble a Polyethylene insert type joint

3202 Assemble a Polyethylene project

3300 Stainless corrugated tube

3301 Cut Stainless corrugated tube

3302 Assemble a Gastite compression connection

3303 Assemble a Tracpipe compression connection

3304 Assemble a Stainless corrugated tube project

3400 Plumbing rough-in installation

3404 Perform an air test on water lines

3405 Perform a water test on water lines

4400 Pipefitting

4401 Demonstrate end to end measurements

4402 Demonstrate center to center measurements

4406 Demonstrate equal spacing

4407 Demonstrate use of constants for offsets

4408 Demonstrate use of fitting allowance by constructing a piping square given a combination of different measuring points

4409 Demonstrate the use of constants by constructing a piping square given a combination of different measuring points and a 45-degree offset

Course Syllabus Level 2:

First Semester (First Marking Period)

Fittings:

Projects, Assignments & Assessments:

Classroom and school orientation and sign-off sheets (3) - Knowledge grade, 150 pts

Accurately Measure Worksheets (1) - Knowledge grade, 100 pts

Read Chapter 4, *Fittings* in the RCA "Plumbing" Textbook

Chapter 4 Word Search, Knowledge grade, 25 pts

Chapter 4 Crossword, Knowledge grade, 50 pts

Chapter 4 Question & Answers, Knowledge grade, 100 pts

Chapter 4 Review Test, Knowledge grade, 100 pts

Chapter 4 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Level 1 Multi Pipe Project, Skill grade, 400 pts
Level 2 Multi Pipe Project, Skill grade, 400 pts
Level 3 Multi Pipe Project, Skill grade, 400 pts
Half Bathroom rough-in Wall practice
Half Bathroom Rough-in Platform Practice
Types of Fittings Test, Skill grade, 100 pts
Pull Inventory from Written List, Skill grade, 100 pts
Make a Written Material List, Skill grade, 100 pts

Duty and Tasks Covered:

2400 Safety

2401 Participate in safety lessons
2402 Perform safety precautions necessary in daily plumbing work
2403 Perform daily work in a clean and organized manner
2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

2516 Identify types of fittings
2521 Make a written material list
2522 Pull inventory from a written material list
2526 Demonstrate advanced public speaking skills

2800 Copper Lines

2811 Adapt copper to other materials

2900 CPVC Lines

2902 Adapt copper to other materials

3100 PEX Lines

3108 Adapt PEX to other materials

3400 Plumbing rough-in installation

3404 Perform an air test on water lines

3405 Perform a water test on water lines

4400 Pipefitting

4401 Demonstrate end to end measurements

4402 Demonstrate center to center measurements

4406 Demonstrate equal spacing

4407 Demonstrate use of constants for offsets

4408 Demonstrate use of fitting allowance by constructing a piping square given a combination of different measuring points

4409 Demonstrate the use of constants by constructing a piping square given a combination of different measuring points and a 45-degree offset

4800 Individualized Plumbing Projects

4801 Complete basic assignment as arranged with instructor

4802 Complete intermediate assignment as arranged with instructor

4803 Complete advanced assignment as arranged with instructor

Level 2 First Semester (Second Marking Period)

Valves and Devices:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 5, *Valves and Devices* in the RCA “Plumbing” Textbook

Chapter 5 Word Search, Knowledge grade, 25 pts

Chapter 5 Crossword, Knowledge grade, 50 pts
Chapter 5 Question & Answers, Knowledge grade, 100 pts
Chapter 5 Review Test, Knowledge grade, 100 pts
Chapter 5 Closed Book Test, Knowledge grade, 100 pts
Written Safety Report, Knowledge grade, 100 pts
Safety Report Presentation, Skill grade, 200 pts
Safety Report – Knowledge grade, 100 pts
Present Safety Report – Skill grade, 100 pts
Update Résumé, Knowledge grade, 100 pts
OSHA 10, Knowledge grade, 1000 pts
Full Bathroom Rough-in Platform Practice
Install valves, Skill grade 1200 pts
Identify valves test, Skill grade, 100 pts
Install meter spread assembly, Skill grade, 100 pts

Duty and Tasks Covered:

100Safety

113 Follow OSHA safety standards as it relates to the industry

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

2517 Identify types of valves

2526 Demonstrate advanced public speaking skills

3500 Water Service

3504 Install a given meter spread assembly

3600 Valves

3601 Install Ball valve

3602 Install stop valve

3603 Install stop-waste valve

3604 Install chrome valve

3605 Install gate valve

3606 Install boiler drain

3607 Install T & P valve

3608 Install swing check valve

3609 Install spring check valve

3610 Install pressure reducing valve

3611 Install anti-freeze hose bibb

3612 Install vacuum breaker

3613 Install thermostatic mixing valve

Level 2 Second Semester (Third Marking Period)

Fixtures:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 6, *Fixtures* in the RCA “Plumbing” Textbook

Chapter 6 Word Search, Knowledge grade, 25 pts

Chapter 6 Crossword, Knowledge grade, 50 pts

Chapter 6 Question & Answers, Knowledge grade, 100 pts

Chapter 6 Review Test, Knowledge grade, 100 pts

Chapter 6 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts
Safety Report Presentation, Skill grade, 200 pts
Safety Report – Knowledge grade, 100 pts
Present Safety Report – Skill grade, 100 pts
Update Résumé, Knowledge grade, 100 pts
Fixture rough-in practice
Install a toilet, Skill grade, 200 pts
Install a tub/shower, Skill grade, 100 pts
Install a tub, Skill grade, 100 pts
Install a shower, Skill grade, 100 pts
Install single handle tub/shower rough-in valve, Skill grade, 100 pts
Install a wall hung sink, Skill grade, 300 pts
Install a drop in sink, Skill grade, 300 pts
Install a pedestal sink, Skill grade, 300 pts
Install a drop-in kitchen sink, Skill grade 300 pts
Install a floor mount laundry tub, Skill grade, 300 pts
Install a wall mount laundry tub, Skill grade, 400 pts
Install a bidet, Skill grade, 300 pts

Duty and Tasks Covered:

1500 Fixtures

1502 Install bathtubs

1506 Install prefabricated shower base drains

1509 Install fixture traps

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

2517 Identify types of valves

2526 Demonstrate advanced public speaking skills

3700 Fixture Installation

3701 Install a P-trap

3702 Install a water supply to a sink

3703 Install a water supply to a toilet

3704 Install the minimum size traps for all residential fixtures

3705 Install a kitchen faucet

3706 Install a basket strainer

3708 Install a lavatory faucet with pop-up drain

3709 Install a wall hung lavatory sink

3710 Install a drop-in lavatory sink

3712 Install a drop-in kitchen sink

3713 Install a laundry faucet

3714 Install a floor mount laundry tub

3715 Install a wall mount laundry tub

3716 Install a floor mounted toilet

3717 Install a tub/shower valve

3718 Install a fiberglass/acrylic tub or tub/shower unit

3723 Install bidet with faucet and drain

3726 Install pedestal sink

Level 2 Second Semester (Fourth Marking Period)

Faucets and Drain Assemblies:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 7, *Faucets and Drain Assemblies* in the RCA “Plumbing” Textbook

Chapter 7 Word Search, Knowledge grade, 25 pts

Chapter 7 Crossword, Knowledge grade, 50 pts

Chapter 7 Question & Answers, Knowledge grade, 100 pts

Chapter 7 Review Test, Knowledge grade, 100 pts

Chapter 7 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Update Résumé, Knowledge grade, 100 pts

Fixture rough-in practice

Install a toilet, Skill grade, 200 pts

Install a tub/shower, Skill grade, 100 pts

Install a tub, Skill grade, 100 pts

Install a shower, Skill grade, 100 pts

Install single handle tub/shower rough-in valve, Skill grade, 100 pts

Install a wall hung sink, Skill grade, 300 pts

Install a drop in sink, Skill grade, 300 pts

Install a pedestal sink, Skill grade, 300 pts

Install a drop-in kitchen sink, Skill grade, 300 pts

Install a garbage disposal, Skill grade, 100 pts

Install a dishwasher, Skill grade, 100 pts

Install a floor mount laundry tub, Skill grade, 300 pts

Install a wall mount laundry tub, Skill grade, 400 pts

Install a bidet, Skill grade, 300 pts

Install a drop in tub with faucet, Skill grade, 200 pts

Install wall-hung urinal with flushometer, Skill grade, 200 pts

Install a water cooler, Skill grade, 300 pts

Duty and Tasks Covered:

1500 Fixtures

1502 Install bathtubs

1503 Install wall mounted fixtures

1505 Install kitchen sinks

1506 Install prefabricated shower base drains

1507 Install lavatories

1509 Install fixture traps

1600 Appliances

1601 Install a dishwasher

1607 Install a garbage disposal

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

2517 Identify types of valves

2526 Demonstrate advanced public speaking skills

3700 Fixture Installation

- 3701 Install a P-trap
- 3702 Install a water supply to a sink
- 3703 Install a water supply to a toilet
- 3704 Install the minimum size traps for all residential fixtures
- 3705 Install a kitchen faucet
- 3706 Install a basket strainer
- 3708 Install a lavatory faucet with pop-up drain
- 3709 Install a wall hung lavatory sink
- 3710 Install a drop-in lavatory sink
- 3712 Install a drop-in kitchen sink
- 3713 Install a laundry faucet
- 3714 Install a floor mount laundry tub
- 3715 Install a wall mount laundry tub
- 3716 Install a floor mounted toilet
- 3717 Install a tub/shower valve
- 3718 Install a fiberglass/acrylic tub or tub/shower unit
- 3723 Install bidet with faucet and drain
- 3726 Install pedestal sink
- 3724 Install wall-hung urinal
- 3728 Install a flushometer
- 3729 Install a water cooler

Course Syllabus Level 3

First Semester (First Marking Period)

Plumbing Equipment and Appliances:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 8, *Plumbing Equipment and Appliances* in the RCA “Plumbing” Textbook

Chapter 8 Word Search, Knowledge grade, 25 pts

Chapter 8 Crossword, Knowledge grade, 50 pts

Chapter 8 Question & Answers, Knowledge grade, 100 pts

Chapter 8 Review Test, Knowledge grade, 100 pts

Chapter 8 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Update Résumé, Knowledge grade, 100 pts

Fixture rough-in practice

Install a toilet, Skill grade, 200 pts

Install a tub/shower, Skill grade, 100 pts

Install a tub, Skill grade, 100 pts

Install a shower, Skill grade, 100 pts

Install single handle tub/shower rough-in valve, Skill grade, 100 pts

Install a wall hung sink, Skill grade, 300 pts

Install a drop in sink, Skill grade, 300 pts

Install a pedestal sink, Skill grade, 300 pts

Install a drop-in kitchen sink, Skill grade, 300 pts

Install a garbage disposal, Skill grade, 100 pts
Install a dishwasher, Skill grade, 100 pts
Install a floor mount laundry tub, Skill grade, 300 pts
Install a wall mount laundry tub, Skill grade, 400 pts
Install a bidet, Skill grade, 300 pts
Install a drop in tub with faucet, Skill grade, 200 pts
Install wall-hung urinal with flushometer, Skill grade, 200 pts
Install a water cooler, Skill grade, 300 pts
Install electric water heater, Skill grade, 100 pts
Install gas atmospheric water heater, Skill grade, 100 pts
Install a water re-circulating pump
Demonstrate how to test voltage
Wire a load to a pigtail
Wire a duplex receptacle to a pigtail
Wire a single pole switch into a circuit

Duty and Tasks Covered:

1500 Fixtures

1502 Install bathtubs
1503 Install wall mounted fixtures
1505 Install kitchen sinks
1506 Install prefabricated shower base drains
1507 Install lavatories
1509 Install fixture traps

1600 Appliances

1601 Install a dishwasher
1602 Install electric and gas water heater

1606 Install a water re-circulating pump

1607 Install a garbage disposal

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

2517 Identify types of valves

2526 Demonstrate advanced public speaking skills

3700 Fixture Installation

3701 Install a P-trap

3702 Install a water supply to a sink

3703 Install a water supply to a toilet

3704 Install the minimum size traps for all residential fixtures

3705 Install a kitchen faucet

3706 Install a basket strainer

3708 Install a lavatory faucet with pop-up drain

3709 Install a wall hung lavatory sink

3710 Install a drop-in lavatory sink

3712 Install a drop-in kitchen sink

3713 Install a laundry faucet

3714 Install a floor mount laundry tub

3715 Install a wall mount laundry tub

3716 Install a floor mounted toilet

- 3717 Install a tub/shower valve
- 3718 Install a fiberglass/acrylic tub or tub/shower unit
- 3723 Install bidet with faucet and drain
- 3726 Install pedestal sink
- 3724 Install wall-hung urinal
- 3728 Install a flushometer
- 3729 Install a water cooler

4000 Water Heaters

- 4001 Hook up a utility pump
- 4002 Demonstrate proper wrapping of a garden hose
- 4003 Install residential electric water heater
- 4004 Install a gas atmospheric vented water heater
- 4017 Install a hot water circulating system

4300 Basic Electricity

- 4303 Demonstrate how to test voltage
- 4307 Wire a load to a pigtail
- 4308 Wire a duplex receptacle to a pigtail
- 4309 Wire a single pole switch into a circuit

Level 3 First Semester (Second Marking Period)

Blueprint Reading and Drafting:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 9, *Blueprint Reading and Drafting* in the RCA “Plumbing” Textbook

Chapter 9 Word Search, Knowledge grade, 25 pts

Chapter 9 Crossword, Knowledge grade, 50 pts

Chapter 9 Question & Answers, Knowledge grade, 100 pts

Chapter 9 Review Test, Knowledge grade, 100 pts

Chapter 9 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Update Résumé, Knowledge grade, 100 pts

Rough-in given fixture, practice

Interpret types of drawings, Skill grade, 100 pts

Interpret various lines used on a drawing, Skill grade, 100 pts

Interpret specifications and dimensions, Skill grade, 100 pts

Interpret piping systems according to color-coding, Skill grade, 100 pts

Convert architect scale to real world measurement, Skill grade, 100 pts

Identify key components of a blueprint, Skill grade, 100 pts

Make a takeoff list for basic blueprint, Skill grade, 100 pts

Layout a building given a basic blueprint, Skill grade, 100 pts

Make an as-built to given scale, Skill grade, 100 pts

Explain laser and transit level for site work, Skill grade, 100 pts

Set up and use transit to find grade/height, Skill grade, 100 pts

Draw an isometric drawing of a DWV system, Skill grade, 100 pts

Draw an isometric drawing of a water line system, Skill grade, 100 pts

Follow an isometric drawing for a complete bathroom, Skill grade, 100 pts

Read and interpret manufacture rough-in specifications for a given fixture, Skill grade, 100 pts

Duty and Tasks Covered:

300 Blueprints and Sketching of Pipe Systems

- 301 Interpret types of drawings
- 302 Interpret various lines used on a drawing
- 303 Interpret specifications and dimensions
- 304 Interpret piping systems according to color-coding

500 Hand and Power Tools

- 503 Explain laser and transit level for site work

2400 Safety

- 2401 Participate in safety lessons
- 2402 Perform safety precautions necessary in daily plumbing work
- 2403 Perform daily work in a clean and organized manner
- 2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

- 2517 Identify types of valves
- 2526 Demonstrate advanced public speaking skills

4200 Blueprint Reading

- 4201 Convert architect scale to real world measurement
- 4202 Identify key components of a blueprint
- 4203 Make a takeoff list for basic blueprint
- 4204 Layout a building given a basic blueprint
- 4205 Make an as-built to given scale
- 4206 Set up and use transit to find grade/height

3400 Plumbing Rough-in Installation

3419 Draw an isometric drawing of a DWV system

3420 Draw an isometric drawing of a water line system

3421 Follow an isometric drawing for a complete bathroom

3422 Read and interpret manufacture rough-in specifications for a given fixture

Level 3 Second Semester (Third Marking Period)

Fixture and Equipment Installation:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 15, *Fixture and Equipment Installation* in the RCA “Plumbing” Textbook

Chapter 15 Word Search, Knowledge grade, 25 pts

Chapter 15 Crossword, Knowledge grade, 50 pts

Chapter 15 Question & Answers, Knowledge grade, 100 pts

Chapter 15 Review Test, Knowledge grade, 100 pts

Chapter 15 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Safety Report – Knowledge grade, 100 pts

Present Safety Report – Skill grade, 100 pts

Update Résumé, Knowledge grade, 100 pts

Fixture rough-in practice

Install stop valve, Skill grade, 100 pts

Install chrome valve, Skill grade, 100 pts

Install a toilet, Skill grade, 200 pts

Install a tub/shower, Skill grade, 100 pts

Install a tub, Skill grade, 100 pts

Install a shower, Skill grade, 100 pts

Install single handle tub/shower rough-in valve, Skill grade, 100 pts

Install a wall hung sink, Skill grade, 300 pts

Install a drop in sink, Skill grade, 300 pts

Install a pedestal sink, Skill grade, 300 pts

Install a drop-in kitchen sink, Skill grade, 300 pts

Install a garbage disposal, Skill grade, 100 pts

Install a dishwasher, Skill grade, 100 pts

Install a floor mount laundry tub, Skill grade, 300 pts

Install a wall mount laundry tub, Skill grade, 400 pts

Install a bidet, Skill grade, 300 pts

Install a drop in tub with faucet, Skill grade, 200 pts

Install wall-hung urinal with flushometer, Skill grade, 200 pts

Install a water cooler, Skill grade, 300 pts

Hook up a utility pump and pump down a water heater, Skill grade, 100 pts

Demonstrate proper wrapping of a garden hose, Skill grade, 100 pts

Install electric water heater, Skill grade, 100 pts

Install gas atmospheric water heater, Skill grade, 100 pts

Install power-vented water heater, Skill grade, 100 pts

Install a water re-circulating pump, Skill grade, 100 pts

Demonstrate how to test voltage, Skill grade, 100 pts

Wire a load to a pigtail, Skill grade, 100 pts

Wire a duplex receptacle to a pigtail, Skill grade, 100 pts

Wire a single pole switch into a circuit, Skill grade, 100 pts

Duty and Tasks Covered:

1500 Fixtures

- 1502 Install bathtubs
- 1503 Install wall mounted fixtures
- 1505 Install kitchen sinks
- 1506 Install prefabricated shower base drains
- 1507 Install lavatories
- 1509 Install fixture traps

1600 Appliances

- 1601 Install a dishwasher
- 1602 Install electric and gas water heater
- 1606 Install a water re-circulating pump
- 1607 Install a garbage disposal

2400 Safety

- 2401 Participate in safety lessons
- 2402 Perform safety precautions necessary in daily plumbing work
- 2403 Perform daily work in a clean and organized manner
- 2404 Demonstrate safe use of all power tools

2500 Plumbing Trade Orientation

- 2517 Identify types of valves
- 2526 Demonstrate advanced public speaking skills

3700 Fixture Installation

- 3701 Install a P-trap

- 3702 Install a water supply to a sink
- 3703 Install a water supply to a toilet
- 3704 Install the minimum size traps for all residential fixtures
- 3705 Install a kitchen faucet
- 3706 Install a basket strainer
- 3708 Install a lavatory faucet with pop-up drain
- 3709 Install a wall hung lavatory sink
- 3710 Install a drop-in lavatory sink
- 3712 Install a drop-in kitchen sink
- 3713 Install a laundry faucet
- 3714 Install a floor mount laundry tub
- 3715 Install a wall mount laundry tub
- 3716 Install a floor mounted toilet
- 3717 Install a tub/shower valve
- 3718 Install a fiberglass/acrylic tub or tub/shower unit
- 3723 Install bidet with faucet and drain
- 3726 Install pedestal sink
- 3724 Install wall-hung urinal
- 3728 Install a flushometer
- 3729 Install a water cooler

4000 Water Heaters

- 4001 Hook up a utility pump
- 4002 Demonstrate proper wrapping of a garden hose
- 4003 Install residential electric water heater
- 4004 Install a gas atmospheric vented water heater
- 4017 Install a hot water circulating system

4300 Basic Electricity

4303 Demonstrate how to test voltage

4307 Wire a load to a pigtail

4308 Wire a duplex receptacle to a pigtail

4309 Wire a single pole switch into a circuit

Level 3 Second Semester (Fourth Marking Period)

Plumbing Repairs and Troubleshooting:

Projects, Assignments & Assessments:

Weekly Time Card (10) – Knowledge grade, 100 pts each

Perform Accurate Measurements - Skill grade, 100 pts

Read Chapter 16, *Plumbing Repairs and Troubleshooting* in the RCA “Plumbing” Textbook

Chapter 16 Word Search, Knowledge grade, 25 pts

Chapter 16 Crossword, Knowledge grade, 50 pts

Chapter 16 Question & Answers, Knowledge grade, 100 pts

Chapter 16 Review Test, Knowledge grade, 100 pts

Chapter 16 Closed Book Test, Knowledge grade, 100 pts

Written Safety Report, Knowledge grade, 100 pts

Safety Report Presentation, Skill grade, 200 pts

Safety Report, Knowledge grade, 100 pts

Present Safety Report, Skill grade, 100 pts

Update Résumé, Knowledge grade, 100 pts

Clear obstructions drains, Skill grade, 900 pts

Repair/replace faucets, Skill grade, 400 pts

Thaw frozen pipes, Skill grade, 100 pts

Repair water closet, Skill grade, 400 pts

Assemble and explain house traps, Skill grade, 400 pts

Use camera, locator and hydro jet on drain, Skill grade, 400 pts

Identify and replace components of a water heater, Skill grade, 400 pts

Diagnose problem with water heater, Skill grade, 400 pts

Install a well-trol tank, Skill grade, 100 pts

Diagnose problem with submersible well pump system, Skill grade, 100 pts

Diagnose problem with a jet pump system, Skill grade, 100 pts

Demonstrate testing of a GFCI receptacle, Skill grade, 100 pts

Demonstrate proper wrapping of an extension cord, Skill grade, 100 pts

Demonstrate use of multi-meter, Skill grade, 400 pts

Wire a load to a pigtail, Skill grade, 100 pts

Wire a duplex receptacle to a pigtail, Skill grade, 100 pts

Demonstrate wiring of basic circuits, Skill grade, 400 pts

Duty and Tasks Covered:

1800 Plumbing Systems Maintenance

1801 Clear obstructions from lavatory drains

1802 Clear obstructions from main drain lines

1803 Clear obstructions from water closets

1804 Repair/replace leaking water faucets or valves

1808 Perform methods to thaw frozen pipes

1811 Replace all components in a gravity and pressure assist tank

2400 Safety

2401 Participate in safety lessons

2402 Perform safety precautions necessary in daily plumbing work

2403 Perform daily work in a clean and organized manner

2500 Plumbing Trade Orientation

2526 Demonstrate advanced public speaking skills

3800 Fixture Repair

3801 Replace cartridge on a single and double handle faucet

3802 Replace springs and washers on a single handle ball type faucet

3803 Replace washers on seat on compression style faucet

3804 Perform a major rebuild on a gravity flush toilet

3805 Perform a major rebuild on a Sloan style flush valve

3806 Perform a major rebuild on a pressure-assisted toilet

3900 Blockages

3901 Use a plunger on a water closet/sink

3902 Use an auger on a water closet

3903 Pull a toilet and check for blockage with a mirror

3904 Run small snake to open bathtub drain line

3905 Run medium size snake to open sink drain/shower drain

3906 Run large snake to open main drain

3907 Assemble and explain a four-hole house trap setup

3908 Assemble and explain a three-hole house trap setup

3909 Assemble and explain a two-hole house trap setup

3910 Assemble and explain a single-hole house trap setup

3911 Run electronic video camera

3912 Run electronic line locator to locate drain line

3913 Use electronic locator to find tank transmitter

3914 Run a small hydro jetter into a drain line

4000 Water Heaters

- 4008 Identify and replace components of a residential electric water heater
- 4009 Identify and replace components of a direct-vented gas water heater
- 4010 Identify and replace components of a power-vented gas water heater
- 4011 Identify and replace components of a wall hung on demand gas water heater
- 4012 Diagnose problem with residential electric water heater
- 4013 Diagnose problem with gas atmospheric vented water heater
- 4014 Diagnose problem with direct-vented gas water heater
- 4015 Diagnose problem with power-vented gas water heater
- 4016 Diagnose problem with a wall hung on demand gas water heater

4100 Well Pumps

- 4104 Install a well-trol tank
- 4105 Diagnose problem with submersible well pump system
- 4106 Diagnose problem with a jet pump system

4300 Basic Electricity

- 4301 Demonstrate testing of a GFCI receptacle
- 4302 Demonstrate proper wrapping of an extension cord
- 4303 Demonstrate how to test voltage
- 4304 Demonstrate how to test continuity
- 4305 Demonstrate how to test amperage
- 4306 Demonstrate how to test resistance
- 4307 Wire a load to a pigtail
- 4308 Wire a duplex receptacle to a pigtail
- 4309 Wire a single pole switch to a circuit

4310 Wire a given parallel circuit

4311 Wire a given series circuit

4312 Wire a combination parallel and series circuit

Certification:

OSHA Certification

TracPipe

GasTite

Supplemental Learning Activities

Students who participate in this program will also have opportunities to participate in the following program and school-sponsored activities:

SkillsUSA: Professional Development Conference, Local Competitions, State Competitions, National Competitions. Students will also be able to participate in yearly events held at BAVTS: Chapter Meetings, fundraising and carnival.

NTHS: Level II and Level III students who have received an “A” in their career and technical program as well as a “B” average at their sending school are eligible to become a member of the BAVTS Chapter of the National Technical Honor Society.

Cooperative Education: Students who have attended six quarters in their career and technical program are eligible to participate in a paid working experience during the PM session of BAVTS. Positions must be available and the student must be recommended by the CTE teacher to be eligible.

Job Shadowing: Students are eligible to visit business and industry partners for one or more days to view the day-to-day operations of this career area.

Internships: Students who have completed six or more quarters of their CTE program are eligible to work for a business and industry partner with the recommendation of the instructor and the availability of assignment.

Field Trips: Students in this program will on occasion attend field trips that expose them to educational experiences within the career field.

College Credit: Commercial Art students are eligible for advanced credit through a Statewide Articulation Agreement developed by the Pennsylvania Department of Education.

Students are recommended to attend post-secondary training upon graduation from BAVTS to ensure success within the career field.