STRANDS AND STANDARDS
PLUMBING 2

Learning that works for Utah
CTE®

Course Description

This is the second course in a sequence that prepares individuals to apply technical knowledge and skill to lay out, assemble, install, and maintain piping, fixtures, and piping systems for stream, hot water, heating, cooling, draining, lubricating, sprinkling, and industrial processing systems. Includes instruction in material selection and use of tools to cut, bend, join, and weld pipes. These courses are based on the current National Center for Construction Education and Research (NCCER) task list.

Intended Grade Level	10-12
Units of Credit	0.5
Core Code	40.08.00.00.105
Concurrent Enrollment Core Code	N/A
Prerequisite	Plumbing 1
Skill Certification Test Number	N/A
Test Weight	N/A
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Plumbing
Endorsement 2	N/A
Endorsement 3	N/A

STRAND 1

Students will participate in personal and leadership development activities through SkillsUSA or another appropriate career and technical student organization.

Standard 1

Student will use communication skills to effectively communicate with others.

- Understand when it is appropriate to listen and to speak.
- Understand and follow verbal and written instructions for classroom and laboratory activities.

Standard 2

Student will effectively use teamwork to respectfully work with others.

- Identify and understand different roles in working with a team.

Standard 3

Student will use critical thinking and problem-solving skills.

- Analyze the cause of the problem.
- Develop a solution to address the problem.
- Implement the plan.
- Evaluate the effectiveness of the plan.

Standard 4

Student will be dependable, reliable, steady, trustworthy, and consistent in performance and behavior.

- Set and meet goals on attendance and punctuality.
- Prioritize, plan, and manage work to complete assignments and projects on time.

Standard 5

Student will be accountable for results.

- Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
- File a regular written report on progress toward completion of assignments and projects.

Standard 6

Be familiar with the legal requirements and expectations of the course.

- Be familiar with the course disclosure statement and all requirements for successful completion of the course.
- Demonstrate workplace ethics, e.g., fair, honest, disciplined.

STRAND 2

Students will participate in work-place readiness activities.

Standard 1

Student will demonstrate employability skills.

- Use a career search network to find career choices.
- Write a resume including a list of demonstrated skills.
- Write a letter of application.
- Complete a job application.
- Participate in an actual or simulated job interview.

Standard 2

Student will participate in a work-based learning experience outside the classroom.

- Student will plan and implement a work-based learning experience aligned with their career goal.

STRAND 3

Students will receive an orientation to the plumbing trade.

Standard 1

Describe the history of the plumbing trade.

Standard 2

Identify the stages of progress within the plumbing trade.

Standard 3

Identify responsibilities of a person working in the construction industry.

Standard 4

State the personal characteristics of a professional.

Standard 5

Explain the importance of safety in the construction industry.

Performance Skills

Understand and demonstrate their knowledge of the plumbing trade.

- Describe the history of the plumbing trade.
- Identify the stages of progress within the plumbing trade.
- Identify responsibilities of a person working in the construction industry.
- State the personal characteristics of a professional.
- Explain the importance of safety in the construction industry.

STRAND 4

Students will understand and demonstrate the safe use of plumbing tools.

Standard 1

Identify the basic hand and power tools used in the plumbing trade.

Standard 2

Demonstrate the proper maintenance procedures to be used for hand and power tools.

Standard 3

Explain safety as it applies to plumbing tools.

Performance Skills

Understand and demonstrate the use of plumbing tools.

- Identify the basic hand and power tools used in the plumbing trade.
- Demonstrate the proper maintenance procedures to be used for hand and power tools.
- Explain safety as it applies to plumbing tools.

STRAND 5

Students will understand and demonstrate the use of plumbing math.

Standard 1

Identify the parts of a fitting and use common pipe measuring techniques.

Standard 2

Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.

Standard 3

Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.

Standard 4

Use a framing square to find the center of fittings.

Standard 5

Figure 45-degree offsets and travel using the Pythagorean Theorem.

Standard 6

Figure 45-degree offsets and travel using a framing square or tape measure.

Performance Skills

Understand and demonstrate the use of plumbing math.

- Identify the parts of a fitting and use common pipe measuring techniques.
- Use fitting dimension tables and a framing square to determine fitting allowances and pipe makeup.
- Calculate end-to-end measurements by figuring fitting allowances and pipe makeup.
- Use a framing square to find the center of fittings.
- Figure 45-degree offsets and travel using the Pythagorean Theorem.
- Figure 45-degree offsets and travel using a framing square or tape measure.

STRAND 6

Students will understand and use plumbing drawings.

Standard 1

Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.

Standard 2

Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.

Standard 3

Interpret plumbing-related information from a set of plumbing drawings.

Standard 4

Use an architect's scale to draw lines to scale and to measure lines drawn to scale.

Standard 5

Discuss how local code requirements apply to certain drawings.

Performance Skills

Understand and use plumbing drawings.

- Identify pictorial (isometric and oblique), schematic, and orthographic drawings, and discuss how different views are used to depict information about objects.
- Explain the types of drawings that may be included in a set of plumbing drawings and the relationship between the different drawings.
- Interpret plumbing-related information from a set of plumbing drawings.
- Use an architect's scale to draw lines to scale and to measure lines drawn to scale.
- Discuss how local code requirements apply to certain drawings.

STRAND 7

Students will understand and demonstrate the use of plastic pipe and fittings.

Standard 1

Identify the common types of materials and schedules of plastic piping.

Standard 2

Identify the common types of fittings used with plastic piping.

Standard 3

Identify and determine the kinds of hangers and supports needed for plastic piping.

Standard 4

Identify the various techniques used in hanging and supporting plastic piping.

Standard 5

Demonstrate the ability to properly measure, cut, and join plastic piping.

Standard 6

Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.

Standard 7

Identify the hazards and safety precautions associated with plastic piping.

Performance Skills

Understand and demonstrate the use of plastic pipe and fittings.

- Identify the common types of materials and schedules of plastic piping.
- Identify the common types of fittings used with plastic piping.
- Identify and determine the kinds of hangers and supports needed for plastic piping.
- Identify the various techniques used in hanging and supporting plastic piping.
- Demonstrate the ability to properly measure, cut, and join plastic piping.
- Follow basic safety precautions for the installation, operation, and maintenance of plastic tubing.
- Identify the hazards and safety precautions associated with plastic piping.

STRAND 8

Students will understand and demonstrate the use of copper pipe and fittings.

Standard 1

Select the correct types of materials for copper piping systems.

Standard 2

Identify types of fittings and valves and their uses.

Standard 3

Select the correct hanger or support for the application.

Standard 4

Select the appropriate personal protective equipment for working with copper piping.

Standard 5

Correctly measure, cut, ream, and join copper piping.

Performance Skills

Understand and demonstrate the use of copper pipe and fittings.

- Select the correct types of materials for copper piping systems.
- Identify types of fittings and valves and their uses.
- Select the correct hanger or support for the application.
- Select the appropriate personal protective equipment for working with copper piping.
- Correctly measure, cut, ream, and join copper piping.

STRAND 9

Students will understand drain, waste, and vent (DWV) systems.

Standard 1

Explain how waste moves from a fixture through the drain system to the environment.

Standard 2

Identify the major components of a drainage system and describe their functions.

Standard 3

Identify types and parts of traps and explain the importance of traps and how traps lose their seals.

Standard 4

Identify the various types of DWV fittings and describe their application.

Performance Skills

Understand drain, waste, and vent (DWV) systems.

- Explain how waste moves from a fixture through the drain system to the environment.
- Identify the major components of a drainage system and describe their functions.
- Identify types and parts of traps and explain the importance of traps and how traps lose their seals.
- Identify the various types of DWV fittings and describe their application.

STRAND 10

Students will understand water distribution systems.

Standard 1

Discuss how water moves from the source, through the water distribution system, and to the fixture.

Standard 2

Identify the major components of water distribution systems and describe the function of each component.

Standard 3

Explain the relationships between the components of a water distribution system.

Performance Skills

Understand water distribution systems.

- Discuss how water moves from the source, through the water distribution system, and to the fixture.
- Identify the major components of water distribution systems and describe the function of each component.
- Explain the relationships between the components of a water distribution system.

STRAND 11

Students will understand and demonstrate the use of fixtures and faucets.

Standard 1

Identify the basic types of materials used in the manufacture of plumbing fixtures.

Standard 2

Discuss common types of sinks, lavatories, and faucets.

Standard 3

Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.

Standard 4

Discuss common types of toilets, urinals, and bidets.

Standard 5

Discuss common types of drinking fountains and water coolers.

Standard 6

Discuss common types of garbage disposals and domestic dishwashers.

Performance Skills

Understand and demonstrate the use of fixtures and faucets.

- Identify the basic types of materials used in the manufacture of plumbing fixtures.
- Discuss common types of sinks, lavatories, and faucets.
- Discuss common types of bathtubs, bath-shower modules, shower stalls, and shower baths.
- Discuss common types of toilets, urinals, and bidets.
- Discuss common types of drinking fountains and water coolers.
- Discuss common types of garbage disposals and domestic dishwashers.