

ATPL-1808: SPECIAL TOPICS: NATURAL GAS PIPE APPLICATIONS AND INSTALLATION

Cuyahoga Community College

Viewing: ATPL-1808 : Special Topics: Natural Gas Pipe Applications and Installation

Academic Term:

Fall 2026

Subject Code

ATPL - Applied Ind Tech - Plumbers

Course Number:

1808

Title:

Special Topics: Natural Gas Pipe Applications and Installation

Catalog Description:

Advanced course covering the application and installation of natural gas piping systems including safety requirements. Also covered are installation techniques, applied math, construction tools and equipment and interpretation of mechanical drawings.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to Plumber's apprenticeship program.

Outcomes

Course Outcome(s):

Discuss the applications of natural gas and other gases piping and identify the different types of pipe.

Objective(s):

1. Identify the applications natural gas and other gases used in the residential and commercial industry.
2. Explain how the different types of pipe are manufactured and discuss the importance of quality control.
3. List the different types of fittings used to join the different types of pipe.
4. Identify the various vertical and horizontal supports, clamps, and suspension hangers.
5. Review the Ohio Gas Code standards relative to the installation and venting of gases.

Course Outcome(s):

Discuss the safety procedures as prescribed by the Occupational Safety and Health Administration (OSHA) and related gas industry standards.

Objective(s):

1. Identify the hazards related to working with gases.
 2. Discuss the procedures used to protect the worker and the building during gas installations.
 3. List the Personal Protection Equipment (PPE) as prescribed by OSHA, required for safe installations.
 4. Explain how gases can cause explosions and even death.
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Course Outcome(s):

Interpret mechanical drawings and schematics and review related math concepts for material estimating, layout procedures, and pipe locations.

Objective(s):

1. Identify gas line requirements on mechanical drawings.
2. Differentiate between mechanical drawings and schematics.
3. Determine pipe locations in the floors, walls, and ceilings from floor plans and specifications.
4. Estimate quantities of pipe and pipe fittings required for mechanical installations.
5. Establish different lists required for materials, tools, and equipment.
6. Review trade-related math concepts necessary for pipe layout and to install mechanical gas systems.

Course Outcome(s):

Describe and follow procedures for locating mechanical requirements for residential and commercial structures.

Objective(s):

1. Locate the work area and position the materials and tools required for mechanical installations.
2. Layout locations of respective gas systems using applied math and geometry.
3. Select proper hand and power tools and safely operate to perform installations.
4. Employ safety precautions as prescribed by OSHA and other related gas industry standards.

Methods of Evaluation:

1. Assignments
2. Attendance
3. Participation
4. Exams/quizzes

Course Content Outline:

1. Applications and Pipe
 1. Residential
 - a. Drainage systems
 - b. Sewer
 - c. Venting
 2. Commercial
 - a. Drainage
 - b. Storm
 - c. Sewer
 - d. Venting
 3. Pipe Manufacturing
 - a. Seamless
 - b. Rolled
 - c. Composition of Materials
4. Fittings
 - a. Wyes
 - b. Sanitary Tees
 - c. Bends
5. Suspension
 - a. Supports
 - b. Hangers
 - c. Clamps
 - d. Fasteners
6. Code standards

- a. Venting
 - b. Drainage
 - c. Storm
1. Safety Procedures
 1. Id Hazards
 - a. Fires
 - b. Abrasions
 - c. Burns
 - d. Physical strains
 2. Procedures for protection of worker(s)
 - a. Pre task safety meetings
 - b. Knowing the safety procedures of job site and employer
 - c. Understanding OSHA regulations
 3. PPE – ID and use
 - a. Fire proof/heat resistance materials
 - b. Proper body, foot and hand protection
 - c. Eye and Face protection
 4. Respiratory risks
 - a. Breathing air
 - b. Environmental
 - c. Protection
 1. Material, layout and locations
 - a. Id supply and waste on drawings
 - i. Code requirements
 - ii. Interpret water and waste lines
 - iii. Understanding what drawings to look at
 - b. Mechanical drawings vs. schematics
 - i. What is on mechanical drawings
 - ii. What is lacking on mechanical drawings
 - iii. Types of schematics
 - iv. Schematic use in the installation process
 - c. Determine locations of pipes
 - i. Understanding floor plans
 - ii. Using the correct revisions
 - iii. Measurements from common locations
 - iv. Understanding job Specifications
 - d. Estimate quantities
 - i. What is estimating
 - ii. How to estimate from drawings and specifications
 - iii. Common procedures
 - e. Making lists
 - i. Tools
 - ii. Safety
 - iii. Equipment
 - iv. Materials
 - f. Review of trade related math
 - i. Types of Measurements
 - ii. Geometry related to the installs
 - iii. Using math for quick lay outs
 2. Installations for Residential and Commercial
 - a. Location, tools and materials required
 - i. Locate area of installation
 - ii. Stage tools required
 - iii. Gather materials
 - iv. Check PPE
 - b. Layout Locations using math
 - i. Drawings for layout
 - ii. Demonstrate use of applied geometry math
 - iii. Waste vs water supply layouts

- c. Selection of tools
 - i. Safe tool useage
 - ii. Tool select
- d. Use of Proper safety equipment
 - i. PPE
 - ii. Jobsite and employer safety regulations
 - iii. Worker safety

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: <https://portal2.tri-c.edu/ReligiousAccommodation/> Religious Accommodation Form. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

<https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf>

Weekly Schedule

	Topics
Week 1	o Introduction to Natural Gas Systems and Applications
Week 2	o Types of Gas Pipe and Materials
Week 3	o Pipe Manufacturing Methods
Week 4	o Fittings and Joining Methods
Week 5	o Supports, Hangers, and Suspension Systems
Week 6	o Ohio Gas Code Overview
Week 7	o Venting Requirements for Gas Systems
Week 8	o Gas Safety Principles and Hazard Identification
Week 9	o OSHA Regulations and PPE
Week 10	o Mechanical Drawings vs. Schematics
Week 11	o Interpreting Mechanical Drawings
Week 12	o Pipe Layout and Location Methods
Week 13	o Trade Math and Applied Geometry
Week 14	o Estimating Materials and Quantities
Week 15	o Residential and Commercial Installation Practices
Week 16	o Review, Applications, and Assessment

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings

Instructor-provided materials

Resources for the Instructor

United Association Training Department. *Drainage*. Annapolis, MD: United Association, www.ua.org/training

United Association Training Department. *Soldering and Brazing*. Annapolis, MD: United Association, www.ua.org/training

Additional Resources for the Instructor

[www.copper.org \(http://www.copper.org/\)](http://www.copper.org/)
[www.kpsec.freeuk.com/ \(http://www.kpsec.freeuk.com/solder.htm\)](http://www.kpsec.freeuk.com/solder.htm) **solder.htm**
[www.brazing.com \(https://catalog.tri-c.edu/www.brazing.com\)](https://catalog.tri-c.edu/www.brazing.com)

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