

# ATSM-1230: FIELD INSTALLATION

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## Cuyahoga Community College

### Viewing: ATSM-1230 : Field Installation

#### Board of Trustees:

2012-05-24

#### Academic Term:

Spring 2019

#### Subject Code

ATSM - Applied Ind Tech- Sheetmetal

#### Course Number:

1230

#### Title:

Field Installation

#### Catalog Description:

Covers the techniques required to layout, cut and fabricate components necessary to construct plenum boxes in heating and cooling systems installations. Included are applied math concepts for layout and cutting operations and drafting exercises.

#### Credit Hour(s):

3

#### Lecture Hour(s):

3

## Requisites

#### Prerequisite and Corequisite

Departmental approval: admission to Sheet Metal Worker's apprenticeship program.

## Outcomes

#### Course Outcome(s):

1. Use orthographic projections to interpret details taken from shop drawings.

#### Objective(s):

1. 1. Apply basic drafting techniques to create projection drawings.
2. 2. Draw three views of fittings and transitions.
3. 3. Identify the ductwork dimensions that are used for component visualization and sizing.

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#### Course Outcome(s):

2. Prepare sheet metal that will become furnace plenums and respective ductwork.

#### Objective(s):

1. 1. Calculate the sizes and allowances of the necessary components.
2. 2. Blank out the material that is needed for laying out duct systems.
3. 3. Operate machinery and power tools to cut sheet metal into the design calculations.

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#### Course Outcome(s):

3. Establish layout techniques that are necessary for the development of heating and cooling components that are needed for field installations.

#### Objective(s):

1. 1. Use layout techniques for design operations.
2. 2. Apply basic math concepts to calculate respective component sizes.
3. 3. Layout component dimensions on flat sheet metal.

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**Course Outcome(s):**

4. Fabricate air handling transmissions of heating and cooling systems.

**Objective(s):**

1. 1. Prepare blanked material by removing excessive material.
2. 2. Operate roll forming and hand brake equipment needed for fabrication.
3. 3. Transform patterns into fittings, sleeves and connectors.

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**Course Outcome(s):**

5. Install fabricated assemblies into heating and cooling systems.

**Objective(s):**

1. 1. Organize heating and cooling system parts with respect to drawing specifications.
2. 2. Construct individual assemblies in conjunction with design requirements.
3. 3. Use proper fastening support systems needed for field installations.

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**Methods of Evaluation:**

1. Tests
2. Quizzes
3. Class participation

**Course Content Outline:**

1. Orthographic projection
  - a. Drafting techniques
    - i. Line quality
    - ii. Drawing tools
    - iii. Projections
    - iv. Overall neatness
  - b. Views
    - i. Top/Plan
    - ii. Front elevation
    - iii. Right side
2. Ductwork dimensions
  - a. Component visualization
  - b. Openings sizes
  - c. Angles
  - d. Component depths
3. Material preparation
  - a. Calculations
    - i. Sizes
    - ii. Allowances
    - iii. Angles
  - b. Blanking
    - i. Layout
    - ii. Overall sizing
  - c. Machinery
    - i. Shears
    - ii. Turning machines
    - iii. Crimping devices
4. Layout
  - a. Techniques
    - i. Basic
    - ii. Parallel Line
  - b. Component sizes

- i. Math concepts
    - ii. Detail interpretation
  - c. Dimension transfer
- 5. Fabrication
  - a. Material preparation
    - i. Excess material removal
    - ii. Allowances
      - 1. Seams
      - 2. Edges
  - b. Equipment
    - i. Roll formers
    - ii. Hand brakes
    - iii. Specialty tools
  - c. Pattern transformation
    - i. Fittings
    - ii. Sleeves
    - iii. Connectors
- 6. Shop exercises

## Resources

International Training Institute. *Core Curriculum*. 2nd. International Training Institute Alexandria, Va., 2004.

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International Training Institute. *Sheet Metal Math*. 2nd. International Training Institute Alexandria, Va., 2007.

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Budzik, Richard. *Today's 40 Most Frequently Used Fittings*. 5th. Chicago, IL, 2011.

## Resources Other

[www.ehow.com/how\\_5114038\\_\(http://www.ehow.com/how\\_5114038\\_install-sheet-metal-roof.html\)install-sheet-metal-roof.html](http://www.ehow.com/how_5114038_(http://www.ehow.com/how_5114038_install-sheet-metal-roof.html)install-sheet-metal-roof.html)  
[ca.oregister.com/.../Sheet-Metal-Installation-Custom-Fabrication-San-Clemente](http://ca.oregister.com/.../Sheet-Metal-Installation-Custom-Fabrication-San-Clemente)  
[www.eagle-tool.us/\(http://www.eagle-tool.us/sheetmetal.htm\)sheetmetal.htm](http://www.eagle-tool.us/(http://www.eagle-tool.us/sheetmetal.htm)sheetmetal.htm)  
[www.titanroofing.com/archsheetmetalinstall.htm](http://www.titanroofing.com/archsheetmetalinstall.htm)

Top of page

Key: 689