

# ATSM-2340: ADVANCED FIELD INSTALLATION

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## Cuyahoga Community College

**Viewing: ATSM-2340 : Advanced Field Installation**

**Board of Trustees:**

2012-05-24

**Academic Term:**

Fall 2018

**Subject Code**

ATSM - Applied Ind Tech- Sheetmetal

**Course Number:**

2340

**Title:**

Advanced Field Installation

**Catalog Description:**

Develop team building skills by engaging in a group exercise that requires interaction among the participants to design, construct, and install the required ductwork for a project in accordance with the parameters of tolerance within a designated work area. Develop a set of construction and mechanical drawings that are needed for this specific learning exercise.

**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):**

Develop team building skills by working together on an approved sheet metal project that involves design, construction and installation of components of a heating and cooling system.

**Objective(s):**

1. Define the responsibilities of the key positions of a construction team.
2. Organize the job tasks and establish the time sequence of the project

**Course Outcome(s):**

Design, construct, and install the required ductwork for a project in accordance with the parameters of tolerance within the work area.

**Objective(s):**

1. Describe the design features that are necessary to adapt ductwork within the work area environment.
2. Coordinate the scope of work with construction teams to ensure installation harmony.
3. Schedule job meetings with construction teams to identify the communication process between the responsibilities.
4. Write correspondences using memos and requests for information (RFI's).
5. Fabricate the components of the duct system.
6. Install fabricated duct components in an organized operation.

**Course Outcome(s):**

Develop a set of drawings required to design and fabricate the necessary ductwork for a specific project.

**Objective(s):**

1. Evaluate system requirements to design ductwork needed to satisfy air flow parameters.
  2. Locate structural members on a drawing that distinguish the work area with respect to the heating and cooling systems.
  3. Draw a floor plan that shows room locations and sizes including large open spaces and common areas.
  4. Provide a reflected ceiling plan that incorporates lights, air terminals devices and soffits and properly locates heating and cooling components.
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**Course Outcome(s):**

Interpret mechanical drawings to properly locate and install volume and fire dampers in compliance with fire safety codes.

**Objective(s):**

1. Explain the purpose for including volume and fire dampers in the design of heating and cooling systems.
  2. Differentiate between applicable codes that affect damper installations.
  3. Examine various construction drawings to establish proper locations of dampers.
  4. Position the ductwork and dampers in accord with the mechanical drawings.
  5. Coordinate the scope of work of the heating and cooling systems with the other trades to ensure adherence to the project schedule.
  6. Design a set of mechanical drawings and details that are required to establish offsets and transitions, location of access doors and main and branch duct lines.
  7. Incorporate the use of a ductulator to maintain proper duct design and air flow.
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**Methods of Evaluation:**

1. Tests
2. Quizzes
3. Class participation

**Course Content Outline:**

1. Team building skills
  - a. Cooperation
    - i. Trades
    - ii. Team members
    - iii. Supervision
  - b. Communication
    - i. Verbal
    - ii. Written
    - iii. Listening
  - c. Construction hierarchy
    - i. Superintendent
    - ii. Foreman
      1. Shop
      2. Field
    - iii. Detailer
  - d. Responsibilities
    - i. Duct design
      1. Detail
      2. Ductulator
    - ii. Fabrication
      1. Construction standards
      2. Equipment parameters
    - iii. Superintendent
      1. Workforce
      2. Schedule
      3. Craftsmanship standards
  - e. Job tasks and time sequence
    - i. Measurements
    - ii. Design
    - iii. Job coordination

- iv. Obstructions
    - 1. Location
    - 2. Avoidance
  - v. Time constraints
    - 1. Detailer
    - 2. Superintendent
    - 3. Shop foreman
2. Ductwork: Design, construction and installation
- a. Design features
    - i. Field measurements
    - ii. Set elevations
    - iii. Obstructions
  - b. Work scope coordination
    - i. Task assignment
    - ii. Material preparation
    - iii. Fasteners
    - iv. Installation process
  - c. Job meetings
    - i. Schedules
    - ii. Job information
    - iii. Specifications
    - iv. Processes
  - d. Correspondence
    - i. Requests for information (RFI"s)
    - ii. Shop tickets
  - e. Component fabrication
    - i. Elbows
    - ii. Offsets
    - iii. Straight duct
    - iv. Oval
    - v. Rectangular
    - vi. Slips and drives
  - f. Installation
    - i. Hanger locations
      - 1. Junction boxes
      - 2. Access panels
    - ii. Suspension systems
      - 1. Strap
      - 2. Unistrut
      - 3. Angles
    - iii. Beam clamps
    - iv. Slips and drives
    - v. Patented duc connectors
3. Project drawing
- a. System requirements
    - i. Air volume
    - ii. Airflow parameters
      - 1. Surface area
      - 2. Directional changes
  - b. Structural
    - i. Coordinates
      - 1. Letters
      - 2. Numbers
    - ii. Weights and sizes
    - iii. Structural member locations
    - iv. Ductwork coordination
  - c. Floor plans
    - i. Room locations
    - ii. Dimensions

- iii. Room identification
- iv. Areas types
  - 1. Common
  - 2. Shafts
  - 3. Open space
  - 4. Corridors
  - 5. Meeting rooms
- d. Reflected ceiling plan
  - i. Suspended grid
  - ii. Concealed spline
  - iii. Drywall
  - iv. Light fixtures
  - v. Air terminal devices
  - vi. Soffits
- 4. Mechanical drawing
  - a. Location of components
    - i. Heating and air conditioning
    - ii. Volume dampers
    - iii. Fire dampers
  - b. Applicable codes
    - i. Building
    - ii. Local
    - iii. State
  - c. Ductwork positioning
  - d. Job coordination
    - i. Trades
    - ii. General contractor
  - e. Drawings
    - i. Offsets
    - ii. Access doors
    - iii. Dampers
    - iv. Duct lines
      - 1. Main

## Resources

International Training Institute. *Core Curriculum*. 2nd. International Training Institute Alexandria,Va., 2007.

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International Training Institute. *Layout Curriculum*. current. International Training Institute Alexandria,Va., 2010.

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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. Practical Publications;Chicago,Il., 2010.

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## Resources Other

www. (<http://www.sheetmetalguy.com/bend-allowance.htm>)**sheetmetalguy.com/bend-allowance.htm**

www. (<http://www.sheetmetallayoutcalculator.com/>)**sheetmetallayoutcalculator.com/**

www.**sheetmetalworkbook.com/**

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