

# ATSM-1060: SHEET METAL OSHA 30

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## Cuyahoga Community College

**Viewing: ATSM-1060 : Sheet Metal OSHA 30**

**Board of Trustees:**

March 2020

**Academic Term:**

Fall 2020

**Subject Code**

ATSM - Applied Ind Tech- Sheetmetal

**Course Number:**

1060

**Title:**

Sheet Metal OSHA 30

**Catalog Description:**

Certification course covering the Occupational Safety and Health Administration (OSHA) regulations for sheet metal worker safety on construction job sites. Covers hazard recognition, Heating, Ventilation and Air Conditioning HVAC equipment placement and safe installation using lifting and hoisting devices. Also includes training requirements for the sheet metal worker and employer and code compliance.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

## Requisites

**Prerequisite and Corequisite**

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

## Outcomes

**Course Outcome(s):**

Incorporate OSHA safety regulations into construction businesses and manage respective operations in compliance with required standards as applied to the sheet metal industry.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain the General Duty Clause and identify employer responsibilities for jobsite safety and employee and employer compliance with OSHA safety and health standards pursuant to the OSHA Act of 1970.
2. Identify the duties of the employee as prescribed by OSHA to be compliant with safety standards.
3. Explain the Whistle Blower Act and discuss protection from discrimination for the worker for reporting a violation of the statutes.
4. Review the standard covering OSHA jobsite inspections and discuss the right to inspect construction sites within reasonable limits and to question privately any employer, owner, operator, agent or employee.
5. Explain the process of issuing citations and discuss the categorization of each.
6. REVIEW Subpart I of the OSHA standard and identify the training requirements, recognize jobsite hazards and discuss sheet metal and and power tools.
7. Identify the resources for help in interpreting OSHA regulations including websites, publications and information applications.

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**Course Outcome(s):**

Survey job site conditions and recognize hazards, and discuss respective OSHA regulations required for worker protection.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Review the OSHA standard and explain the hazards commonly found on job sites.
2. Identify the fall protection equipment used to arrest falls and discuss the importance of regular inspections.
3. Review the OSHA standard and discuss compliance regulations for multiple types of scaffolding.
4. Identify the common types of scaffolding generally used on jobsites and discuss common uses of each.
5. Discuss the erection procedures for assembling scaffolds and identify manufacturer specifications for each.
6. Perform detailed inspections of jobsite ladders to identify defects and or violations.
7. Identify the electrical hazards on jobsite with respect to the sheet metal worker.
8. Discuss the hazards related to the sheet metal worker with respect to sheet metal welding applications.
9. Discuss the dangers of working in confined spaces, working procedures including permits, air monitoring and rescue operations.

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**Course Outcome(s):**

Discuss the jobsite use of motorized vehicles and mechanized equipment as prescribed in the OSHA standards and discuss the dynamics of crane operation and identify and correct potential unsafe work practices.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Demonstrate and explain the application of hand signals with respect to cranes.
2. Recognize improper crane signaling and discuss the resulting hazards.
3. Discuss employer responsibility and duties with respect to Subpart O and Subpart CC of the OSHA standard.
4. Discuss the jobsite use of motorized vehicles including swing radii, operator visibility and struck by and caught in between hazards.

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**Course Outcome(s):**

Explain and discuss contractor training and code requirements for employees per the OSHA standard.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Identify the respective health hazards with respect to routes of entry into the human body.
2. Describe the health effects on the worker with respect to various jobsite health hazards.
3. Describe the requirement of training the worker as prescribed in the OSHA standard.
4. Discuss permissible exposure limits of silica, asbestos and lead for the worker on construction sites.
5. Identify and explain the OSHA working regulation per the existing codes.

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**Course Outcome(s):**

Discuss the principles of rigging as it pertains to the sheet metal industry including rigging equipment, sling angles and inspections.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. List and define the terms related to sheet metal rigging.
2. Differentiate between synthetic and wire rope slings.
3. List and describe the rigging equipment used in sheet metal hoisting operations.
4. Discuss the effect of sling angles with respect to lifting capacities.

5. List and describe the hazards related to rigging and hoisting.
  6. Describe the proper procedures followed for inspecting and storage of rigging equipment.
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**Methods of Evaluation:**

1. Class participation
2. Quizzes
3. Tests

**Course Content Outline:**

1. Construction business safety and management
  - a. Terminology
    - i. General duty
    - ii. Whistle blower
    - iii. Competent person
    - iv. Qualified person
    - v. Authorized person
    - vi. Citation
    - vii. Compliance officer
    - viii. Informal conference
    - ix. Citation contest
    - x. Other than serious
    - xi. Willful
    - xii. Focus four
  - b. General Duty Clause
    - i. Employer responsibility
    - ii. Consensus standards
  - c. Duties of employee
    - i. Training
    - ii. Inspections
    - iii. Hazards review
    - iv. Safe work practices
    - v. Contacting local OSHA office
  - d. Whistle Blower Act
    - i. Right to exercise rights
    - ii. Right to stop work
    - iii. Filing procedures
      1. Employer notification
      2. Inform OSHA
      3. Time limitations
  - e. Jobsite inspections
    - i. Right of entry
    - ii. Opening conference
    - iii. Inspection
    - iv. Interview
    - v. Closing conference
    - vi. Employer/employee rights
      1. Before
      2. During
      3. Aft
  - f. Issuing citations
    - i. Diminish
    - ii. Other than serious
    - iii. Serious
    - iv. Repeat
    - v. Willful
  - g. Subpart I

- i. Training requirements
      - 1. Guarding
      - 2. Condition of tools
    - ii. Hand tools
    - iii. Portable power tools
      - 1. Gas
      - 2. Air
      - 3. Electrical
      - 4. Hydraulic
      - 5. Powder actuated
  - h. Interpreting OSHA regulations
    - i. Code of Federal Regulations CFR 1926
    - ii. Website
    - iii. Letters of interpretation
    - iv. Review commission
    - v. Preamble
- 2. Hazard recognition
  - a. Common hazards
    - i. Struck by
    - ii. Caught in between
    - iii. Falls
    - iv. Electrocution
  - b. Fall protection equipment
    - i. Harness
    - ii. Lanyard
    - iii. Anchor point
    - iv. Restraints
  - c. Scaffolding
    - i. Training
    - ii. Inspections
    - iii. Erecting/dismantling
    - iv. Components
  - d. Types of scaffolding
    - i. Tube and coupler
    - ii. Frame
    - iii. Aerial lifts
    - iv. Differences
  - e. Scaffold erection procedures
    - i. Plan
    - ii. Training
    - iii. Fall protection
  - f. Ladders
  - g. Ratings
    - i. Type I
    - ii. Type II
    - iii. Type III
    - iv. Type I-A
  - h. Types
    - i. Straight
    - ii. A-frame
    - iii. Extension
    - iv. Fixed
    - v. Job built
  - i. Inspections
    - i. Feet
    - ii. Rails
    - iii. Rung lock
    - iv. Surface
    - v. Hardware

- vi. Labels
  - vii. Rope and pulley
  - viii. Rung and steps
  - ix. End caps
  - j. Electrical hazards
    - i. Electrocution
    - ii. Ground Fault Circuit Interrupter
    - iii. Cord duty rating
    - iv. Arc flash
    - v. Power line
    - vi. Other
  - k. Welding
    - i. Personal protective Protection
    - ii. Fire protection
    - iii. Compressed gas cylinders
    - iv. Equipment protection
  - l. Confined spaces
    - i. Permits
      - 1. Entry
      - 2. Hot work
    - ii. Air monitoring
      - 1. Oxygen levels
      - 2. Flammable gases/vapors
      - 3. Combustible dust
      - 4. Respirator
    - iii. Rescue
  - m. Emergency rescue plan
    - i. Written
    - ii. Job responsibilities
  - n. Team
    - i. Names
    - ii. Emergency numbers
    - iii. Attendant
  - o. Heavy equipment
    - i. Crane
      - 1. Dynamics
      - 2. Drift
      - 3. Side loads
      - 4. Working radius
  - p. Types
    - i. Small hydraulic
    - ii. Large
    - iii. Lattice
    - iv. Truck
    - v. Knuckle boom
  - q. Signals
    - i. Hand
    - ii. Verbal
    - iii. Audio
  - r. Unsafe work practices
    - i. Subpart O
      - 1. Swing radius
      - 2. Quick coupler
      - 3. Back up alarm
      - 4. Blind spots
    - ii. Overloading
    - iii. Free swing lifting
    - iv. Hydraulics
3. Training and code

- a. Contractor training
  - i. Employer responsibility
  - ii. Employee training
  - iii. Safety policies
- b. Code requirements
  - i. Code adherence
  - ii. Hazard recognition
  - iii. OSHA notifications
- c. Hazards identification
  - i. Routes of entry
    - 1. Inhalation
    - 2. Absorption
    - 3. Injection
  - ii. Job related
- d. Health effects
  - i. Acute
  - ii. Chronic
  - iii. Carcinogenic
- e. Job site health hazards
  - i. Radiation
  - ii. Asbestos
  - iii. Silica
  - iv. Galvanic poisoning
  - v. Lead
- f. Training the worker
  - i. Hazard communication
  - ii. Standard Data Sheet
  - iii. Global Harmonization System
- g. Permissible Exposure Limits
  - i. Silica
  - ii. Asbestos
  - iii. Lead
- h. OSHA working regulations
  - i. Worker safety
  - ii. Jobsite hazard recognition
  - iii. Code compliance
- 4. Principles of rigging
  - a. Terminology
    - i. Sling
    - ii. Hooks
    - iii. Shackle
    - iv. Weight limits
    - v. Sling angle
    - vi. Hoist
    - vii. Block and tackle
    - viii. Chain hoist
    - ix. Choke
    - x. Hitch
    - xi. Knots
    - xii. Bird caging
  - b. Sling: synthetic versus wire rope
    - i. Synthetic
      - 1. Durability
      - 2. Stitching
      - 3. Loop / eye hook
      - 4. Pinching
      - 5. Lifting capacity
    - ii. Wire rope

1. Wire lay
  2. Bird caging
  3. Lifting capacity
  4. Eye hook
  5. Less durable
  6. Dog leg
  7. Kinking
- c. Sheet metal rigging equipment
- i. Well wheels
  - ii. Block and tackle
  - iii. Chain hoist
  - iv. Sheet clamps
  - v. Sling cover
  - vi. Swivels
- d. Sling angle with respect to lifting capacities
- i. Reduced lifting loads
  - ii. Maximum angle: 30 degrees
- e. Rigging/hoisting hazards
- i. Caught under sheet metal load
  - ii. Caught between
  - iii. Struck by
  - iv. Amputations
  - v. Roof top unit shift during lift
- f. Rigging: inspection and storage
- i. Inspection
    1. Schedule
      - a. Daily
      - b. Monthly
      - c. Yearly recorded
    2. Visible tags
    3. Wear, tears, cuts and abrasions
    4. Broken welds
    5. Stretching
    6. Broken wires
    7. Stitches
    8. Socket terminal
    9. Corrosion
    10. Pins
    11. Latches
    12. Weight indicator
  - ii. Storage
    1. Rigging cabinets
    2. Suspended storage
    3. Clean and dry areas
    4. Chemical free

## Resources

Manncomm, . *29 CFR. 1926 OSHA Construction Industry Handbook*, . 2015 Edition. Manncomm Davenport, Iowa, , 2015. 2015.

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Mancomm. *Introduction to OSHA Student Text*. current. Mancomm, Davenport, Iowa, 2013. 2013.

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CPWR. *OSHA 500* . current edition. CPWR, Silver Spring, MD, 2015. 2015.

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## Resources Other

[www.osha.gov](http://www.osha.gov) (<http://www.osha.gov>)

[www.niosh.gov](http://www.niosh.gov) (<http://www.niosh.gov>)

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