

# ATSM-2110: PLANS AND SPECIFICATIONS

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## Cuyahoga Community College

### Viewing: ATSM-2110 : Plans and Specifications

**Board of Trustees:**

November 2020

**Academic Term:**

Fall 2021

**Subject Code**

ATSM - Applied Ind Tech- Sheetmetal

**Course Number:**

2110

**Title:**

Plans and Specifications

**Catalog Description:**

Introduces the student to construction and shop drawings. Interpretation of the drawings and how they are generated will be discussed. In addition, specifications and how they are used in conjunction with drawings will be covered.

**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):**

Analyze the construction process and discuss how drawings are used as a tool of communication and how contracts are written.

**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 hierarchy of construction from the architect/owner to all levels of labor.
2. Discuss how construction drawings are the instructions for constructing a building.
3. Identify the respective sheets that comprise a set of drawings including architectural, mechanical and electrical and how they relate to specifications.
4. Describe how contracts are multifaceted and how they validate the work scope, job and material selection.
5. Discuss the bidding process, performance clauses and the awarding of contracts.

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**Course Outcome(s):**

Translate the language of blueprints, including abbreviations, conventions and symbols.

**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 composition and organization of a set of specifications.
2. Discuss work scope and describe the requirements of the respective trades.
3. Analyze a set of specifications and identify the criterion for respective installations.
4. Describe testing procedures for mechanical trades as written in the job specifications and contract documents.

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**Course Outcome(s):**

Develop written communications used in construction administration including material and equipment submittals, time lines, information clarification and work change orders.

**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 how material and equipment submittals are used to clarify the products described in the specifications.
2. Identify the submittals from trades that affect the work scope of the heating, ventilation and air conditioning system.
3. Describe how time lines for construction are developed and how different factors affect the actual work schedule.
4. Explain how delays and contributing factors affect the time line of the job and construction costs.
5. Explain the process of clarifying information through RFI's.
6. Explain the importance of being thorough when interpreting construction drawings and specifications.
7. Describe how change orders affect the overall job cost.
8. Explain how work change orders are written and how they help orchestrate a change to the plans and specifications.

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**Methods of Evaluation:**

1. Quizzes, tests and class participation
2. Student will demonstrate proficiency in construction drawing interpretation

**Course Content Outline:**

1. Drawings, contracts, and communications
  - a. Drawings
    - i. Convey information
    - ii. Compile material list
    - iii. Manpower
    - iv. Scheduling
  - b. Contracts
    - i. Scope of work
    - ii. Time lines and deadlines
    - iii. Payment schedule
    - iv. Legal
    - v. Types
      1. Firm price
      2. Negotiated
      3. Time and Material
    - vi. Bonding
    - vii. Bid
    - viii. Performance
    - ix. Completion
  - c. Communication
    - i. Addendums
    - ii. Job report
    - iii. RFI
  - d. Hierarchy
    - i. Professionals
      1. Architect
      2. Engineer
      3. Project manager

- ii. Labor
    - 1. Superintendent
    - 2. Foreman
    - 3. Journeyman
    - 4. Apprentice
  - e. Construction drawings
    - i. Instructions for building
    - ii. Drawing sheets
      - 1. Civil
      - 2. Architectural
      - 3. Structural
      - 4. Mechanical
      - 5. Electrical
      - 6. Specialty
  - f. Bidding process
    - i. Formal
    - ii. Informal
    - iii. Referral
    - iv. Rebid
- 2. Translation of drawings
  - a. Language
    - i. Abbreviations
    - ii. Symbols
    - iii. Geographic differences
    - iv. General notes
  - b. Specifications
    - i. Divisions
    - ii. Contractual
    - iii. Sheet metal
      - 1. Wall thickness
      - 2. Penetrations
      - 3. Equipment required
      - 4. Testing and balancing
      - 5. Fire protection
  - c. Work scope
  - d. Testing procedures
    - i. Balancing
    - ii. Air pressure
    - iii. Air flow
    - iv. Start up
- 3. Construction administration
  - a. Submittals
    - i. Manufacturer's specifications
    - ii. Size requirements
    - iii. Clarification of equipment required
  - b. HVAC submittals
    - i. Equipment
    - ii. Same space conflicts
    - iii. Design requirements
    - iv. Structural support requirements
  - c. Time lines
    - i. Gantt chart
    - ii. Completion schedule
    - iii. Delivery
    - iv. Job coordination
  - d. Construction delays
    - i. Weather
    - ii. Design changes
    - iii. Labor disputes

- iv. Project Labor Agreements (PLA)
- v. Suppliers
- e. Information clarification
  - i. Request for information (RFI)
  - ii. Addendums
  - iii. Job reports
  - iv. Job meetings
  - v. Verify in field (VIF)
- f. Change orders
  - i. Additional charges
  - ii. Coordination of trades
  - iii. Time line adjustments
  - iv. Manpower requirements
  - v. Revision to drawings

## Resources

McGraw Hill Construction . *Sweets Catalog File*. 2007 Edition. NY, NY, publisher, McGraw Hill, 2007.

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Supervisory Training Program. *International Training Institute*. First Edition. Scottsdale, Arizona; Thomas Schleifer Publishing, 2007.

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Sheet Metal and Air Conditioning Contractors National Association, Inc. . *HVAC Systems Applications*. 5th Edition . Chantilly, VA., SMACNA publisher, 1995. 1995.

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International Training Institute. *Reading Plans and Specifications*. first edition. Alexandria, Virginia ; International Training Institute, 2007. 2007.

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James Lincoln Arc Welding Foundation. *How to Read Shop Drawings*. current. Cleveland, Ohio: James Lincoln Arc Welding Foundation, 2008.

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## Resources Other

<https://www.workforcedevelopment.com/fundamentals/blueprint.html>

<https://www.tpctraining.com/products/reading-blueprints> (<https://www.tpctraining.com/products/reading-blueprints/>)

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