

# ATMT-1300: MANUFACTURING PROCEDURES

## Cuyahoga Community College

**Viewing: ATMT-1300 : Manufacturing Procedures**

**Board of Trustees:**

September 2025

**Academic Term:**

Fall 2025

**Subject Code**

ATMT - Appd Ind Tech-ManufacturingTec

**Course Number:**

1300

**Title:**

Manufacturing Procedures

**Catalog Description:**

Principles of blanking and/or piercing dies; bending; screw and dowel holes; die life; punches; pilots; die block construction; strippers and stock guides; shredders and knockouts; nest gages; pushers; die stops; stock material utilization; strip layouts; and die sets. Includes techniques and theory of building stamping dies with topics including cutting and forming operations, primary die components, and internal parts of complete die.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

### Requisites

**Prerequisite and Corequisite**

ATMT-1200 Machine Tool Theory or concurrent enrollment, and departmental approval: Admissions to Manufacturing Technology apprenticeship program.

### Outcomes

**Course Outcome(s):**

N/A

**Objective(s):**

1. Describe the basic requirements of metal fabrication in a die shop.
2. Proceed in the shop on own initiative, demonstrating a basic die understanding.
3. Prove a practical knowledge of basic die construction terminology.
4. Demonstrate stock strip maximization, and punch strength.
5. Discuss and explain die safety and maximum production.

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**Methods of Evaluation:**

1. Quizzes
2. Classroom assignments
3. Classroom participation
4. Exams

**Course Content Outline:**

1. Blanking and piercing dies

- a. Shearing
- b. Plastic deformation
- c. Fracture
- d. Stripping
- e. Penetration
- f. Rest position

2. Bending

- a. Stresses
- b. Curve allowance
- c. Bend allowances
- d. Bending action
- e. Wedge action

3. Die life

- a. Relative life
- b. Excessive wear
- c. Punch life
- d. Sidewall finish
- e. Chipping
- f. Cutting wear
- g. Punches
- h. Categories
- i. Types
- j. Groups
- k. Doweling punches
- l. Stability
- m. Load distribution

4. Punch plates

- a. Clearances
- b. Assembly
- c. Fitting

5. Die block construction

- a. One-piece die rings
- b. Sharpening lands
- c. Peen and shear
- d. Sectional die blocks
- e. Stability
- f. Strippers and knockouts
- g. Hook pin
- h. Box type
- i. Categories and types
- j. Guides
- k. Pressure pads

6. Shedders and stock guides

- a. Positive shedders
- b. Laminated shedders
- c. Flangless
- d. Spring

7. Nest gauges

- a. Accuracy requirements
- b. Loading ease
- c. Foolproof nesting
- d. Pin type
- e. Fixed
- f. Shoulder type
- g. Pushers
- h. Flat spring

- i. Nose contour
- j. Heavy duty
- k. Wipers
- l. Air cylinder
- m. Construction
- n. Heat treat requirements
- o. Spring pressure
- p. Stock material utilization and layout
- q. Maximum use of stock
- r. Standard layout techniques
- s. Grain direction
- t. Projecting contours
- 8. Die sets
  - a. Terminology
  - b. Die shoes
  - c. Punch holders
  - d. Flanges
  - e. Guide posts
  - f. Shut height
  - g. Materials
  - h. Standard sets
  - i. Die protection sensors
  - j. CAM dies

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

### **Resources for the Instructor**

Hardman, William. *Basic Machine Shop Theory*. Washington: NTMA Textbook Series, 1982.

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Krar, Steve and Check Albert. *Technology of Machine Tools*. Westerville: Glencoe/McGraw-Hill, 1997.

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Taylor, David. *Blueprint Reading for Machinists*. 5th ed. Albany, New York: Delmar, 1992.

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Taylor, David. *Machine Trades Blueprint Reading*. Albany, New York: Delmar, 1985.

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Walker, John. *Machining Fundamentals*. South Holland: Goodheart-Wilcox, 1993.

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Ostergaard, Eugene. *Basic Dimensioning*. New York: McGraw Hill, 1983.

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