

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.

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.

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

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

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

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

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

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