ATMT-1500: MANUFACTURING TECH SKILLS I

Cuyahoga Community College

Viewing: ATMT-1500 : Manufacturing Tech Skills I

Board of Trustees:

September 2025

Academic Term:

Fall 2025

Subject Code

ATMT - Appd Ind Tech-ManufacturingTec

Course Number:

1500

Title:

Manufacturing Tech Skills I

Catalog Description:

Advanced study of relationship of engineering drawings to applications of machine shop production of precise parts, die, and mold components, to provide students with theory on use of coordinate measuring machine (CMM) for machine tool trades. Machine shop engineering drawing mathematics, used in development and production of part from print in machine shop, will be stressed. Application of engineering drawing skills on projects made in shop. Emphasis on geometric dimensioning. Students will learn to read and comprehend advanced engineering drawings from various industries.

Credit Hour(s):

4

Lecture Hour(s):

4

Requisites

Prerequisite and Corequisite

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

Outcomes

Course Outcome(s):

N/A

Objective(s):

1. Interpret technical and advanced sketching lines through the use of standard shop formulas.
2. Demonstrate an understanding of advanced principles of projection SI Metric System.
3. Demonstrate an understanding of machine elements and processes in sectional views.
4. Implement processes for computerized systems: NC, CNC, CAD, and CAM manufacturing.
5. Apply dimension of advanced orthographic projection third-angle projection drawing using computer.
6. Implement the use of a calculator in converting degrees to decimal degrees and reverse.
7. Demonstrate an understanding of the principals in advanced formulas used in the manufacture of related parts.
8. Determine the proper use of finish symbols.
9. Determine proper tapers, standard tapers, necks limits on die blocks and mold cavities.

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation

Course Content Outline:
1. Sketching and standard shop formulas
   a. Roll pin formulas
   b. Electrode construction
   c. Wire EDM calculation from point to point
2. Advanced principles of projection system
   a. Form tolerance
   b. Orientation tolerance
   c. Profile tolerance
   d. Runout tolerance
   e. Location tolerance
   f. Feature control frames
   g. Material conditions
   h. ANSI Y 14.5 ISO symbols
3. Machine elements and processes in sectional views
   a. Conversion charts
   b. Layout of cavities in a mold block
   c. Layout of punches and dieblocks
4. Pictorial drawings
   a. Industrial production working
   b. Machine and tool drawing
   c. Die assembly drawings
   d. Mold assembly drawings
5. CNC
   a. Manual part programming
   b. Advantages of the CNC
   c. Part programming
6. Orthographic projection. third-angle projection drawing using a computer
   a. Rotation of a part
   b. X-Y Planes and points
   c. Isoplanes
   d. Viewpoint configuration
7. Calculator conversion degrees to decimal degrees and reverse.
   a. Ratio of sides as derived from a blue print
   b. Relationship of calculator functions to an advanced shop print
   c. Related angles from an orthographic and isometric blueprint drawing
   d. Blueprint readouts on degrees and decimal degrees
   e. Function of angles as related to the manufacture of a precision part
8. Advanced formulas used in the manufacture of related parts
   a. Guidelines of formulas in the machinist handbook
   b. Surface grinding angular formulas for precision fits on mold seals and die parts
9. Determine the proper use of finish symbols
   a. Function datum symbols
   b. Datum target symbols
   c. Reference symbols
   d. Basic dimension
   e. Target zones
   f. Size features
10. Tapers
   a. Draft taper calculations on plastic injection mold cavities and cores
   b. Die-life draft for slug clearance

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.

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

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

Hardman, William. *Practical Mathematics for the Metalworking Trainees.* NTMA Publishers, 1993.

Olivo, Thomas P. *Blueprint Reading and Technical Sketching for Industry.* 2nd ed. Delmar Publishers, 1998.

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