ATMT-2500: MANUFACTURING TECHNOLOGY SKILLS II

Cuyahoga Community College

Viewing: ATMT-2500 : Manufacturing Technology Skills II

Board of Trustees:
1999-07-22

Academic Term:
Spring 2019

Subject Code
ATMT - Appd Ind Tech-ManufacturingTec

Course Number:
2500

Title:
Manufacturing Technology Skills II

Catalog Description:
Study of relationship of engineering drawings to applications of manufacturing part for CNC machines, screw machines, mold, and die components. Topics include dimension and tolerance; form tolerances; calculation of tolerance using equations; calculation of tolerances using standard shop formulas; profile and run out tolerances; location tolerances; geometric dimensioning; geometric applications; transferring engineering drawing using computer graphics; and development of engineering drawing with computer.

Credit Hour(s):
4

Lecture Hour(s):
4

Requisites

Prerequisite and Corequisite
ATMT-2300 Advanced Manufacturing Procedures or concurrent enrollment, and departmental approval.

Outcomes

Course Outcome(s):
N/A

Objective(s):
1. Describe the applications required to manufacture a part for CNC machines, screw machines, mold, and die components through the use of engineering drawings.
2. Describe standard dimensions and tolerance requirements for geometric tolerance and dimensioning.
3. Apply form tolerances to manufactured parts.
4. Calculate tolerance using standard shop equations, and perform calculations of tolerances using standard shop formulas.
5. Describe profile and run out tolerances, location tolerances.
6. Describe geometric dimensioning and geometric applications.

Methods of Evaluation:
1. Quizzes
2. Exams
3. Classroom participation
4. Demonstration project evaluated on site.

Course Content Outline:

1. CNC machines
   a. Fixed cycles
   b. Tooling
   c. Postprocessor statements
   d. APT
   e. Tool compensation
   f. Tool motion
   g. Networking
   h. Tool path fundamentals
2. Dimension and tolerance guidelines
   a. Key factors about data
   b. Functional and nonfunctional data
   c. Simulated data
   d. Qualified data
   e. Contacting functional data
   f. Multiple data
   g. Offset data
   h. Equalizing data
   i. Datum targets
3. Form tolerances
   a. Flatness
   b. Straightness
   c. Roundness
   d. Cylindricity
   e. Evaluation of roundness and cylindricity
   f. Perpendicularly
   g. Angularity
   h. Profiles
   i. Runouts
4. Calculation of tolerance using equations
   a. Profile of a line
   b. Coplanar surface
   c. Quick check method
   d. Coplanarity measurement
5. Calculation of tolerances using standard shop formulas
   a. Roll pin dimensioning
   b. Bi-directional calculations
   c. Projected zone calculations
   d. Pattern calculations
   e. Feature formulas
   f. Sinebar formulas
   g. Machinist handbook formulas
6. Profile and run out tolerances
   a. Total runout (outside iameter data)
   b. Total runout (inside diameter data)
7. Location tolerances measurement of position
   a. Coordinate dimensioning
   b. Conversion zones
   c. Single feature position
   d. Symmetry applications
8. Geometric dimensioning angularity measurement
   a. Surface to surface
   b. Sine bar applications
   c. Sine plate applications
   d. Angular gage block method
   e. Angularity of a hole
   f. Upside down use of a sinebar

9. Geometric applications to surface measurement
    a. Profile of a surface
    b. Using data
    c. Profile of a line
    d. Zero position tolerance
    e. Coaxial features
    f. Surface plate setups
    g. Simple caliper measurement
    h. Functional gauging
10. Transferring an engineering drawing using computer graphics
    a. Sketches to CAD
    b. Revision drawings to CAD
    c. Adding properties to your drawing
    d. Deleting features from a composite solid
    e. Listing information and controlling variables
    f. Cutting sections

Resources

Griffith, Gary. *Measuring and Gauging Geometric Tolerances.* Englewood, New Jersey: Prentice Hall, 1994.

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

Lowell, Foster. *Geometric Tolerancing and Dimensioning.* NTMA Publication, 1994.

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