ATMT-2600: CNC PROGRAMMING/OPERATIONS

Cuyahoga Community College

Viewing: ATMT-2600 : CNC Programming/Operations

Board of Trustees:
1999-07-22

Academic Term:
Spring 2019

Subject Code
ATMT - Appd Ind Tech-ManufacturingTec

Course Number:
2600

Title:
CNC Programming/Operations

Catalog Description:
Fundamentals of computer application as aid to machining processes. Emphasis on engineering drawing analysis, using trigonometry and other forms of mathematics to determine programming points; ascertaining implied part dimensions; determinations of machining parameters; calculation of speeds; feeds and tool offset; establishment of work zero and tool home positions. Manual programming of computer numerical control (CNC) machines using G-codes; tooling and set-up of CNC lathes and milling machines for machining operations; verification of toolpaths by simulation; and operating CNC machines to produce mechanical parts.

Credit Hour(s):
2

Lecture Hour(s):
1
Lab Hour(s):
2

Requisites

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

Outcomes
Course Outcome(s):
N/A

Objective(s):
1. Explain the principle, application and advantage of CNC.
2. Perform hand operations such as inching, traversing, and positioning.
3. Apply absolute and incremental methods to place entries on sheets using rules for block format.
4. Program outline of parts to be turned and milled.
5. Recognize error alarms and take corrective action.
6. Load, edit, delete, and save program.
7. Set up CNC machines for machining operations.

Methods of Evaluation:
1. Lab reports, program sheets and work-piece inspection
2. Quizzes

3. Classroom participation
4. Exams

Course Content Outline:

1. Introduction
    a. CNC machines description
    b. Tool-holder positions
    c. Working data
    d. Cutting values
2. Hand operation
    a. Operating elements
    b. Traverse indication
    c. +, - signs
    d. Inching operation
    e. Cutting off power
    f. Positioning tools
3. CNC operation
    a. Operating elements
    b. Metric/inch units
    c. CNC-main elements
    d. Set-up program
    e. Coordinate system
    f. Tool path
    g. Kinds of program
    h. Geometrical information
    i. Feed and speed
    j. G-functions
    k. Format
4. Programming
    a. Positioning
    b. Fixed cycle
    c. Interpolations
    d. Threading
    e. Control of dimensions
5. Program input
    a. Input formats
    b. Inputting data
    c. Program input
    d. Figure keys, word display, memory key, delete key
6. Errors
    a. Causes
    b. Corrective measures
7. Running program
    a. Positions of tool-holders
    b. Turning and milling tools, etc.
    c. Machine tooling and fixturing

Resources

Lin, S. C. Jonathan. *Computer Numerical Control: From Programming to Networking.* Delmar, 1994.

Resources Other

1. CNC programming tutorials software.

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