MACH A133: CNC PROGRAMMING-MASTERCAM 1

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	095630 - Machining and Machine Tools
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 45; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Students will receive hands-on training in the use of Mastercam CNC programming software. The basics of two-dimensional part programming, including geometry development, milling, drilling, tapping, pocketing, and more will be explored. ADVISORY: CHT A100, CIS A100, or MACH A130. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate entry level skills in programming CNC machine tools using a PC.
2. Demonstrate a working knowledge of the basic machining procedures performed through Mastercam.

Course Objectives

- 1. Develop entry level skills at programming CNC machine tools using a microcomputer.
- 2. Have a working knowledge of the basic machining operations performed through Mastercam.
- 3. Develop skill at creating simple part geometry on the computer.
- 4. Develop skill at driving cutting tools on the computer.
- 5. Develop skill at editing and processing machine language files generated by Mastercam.
- 6. Develop a working knowledge of the process of cutter path regeneration.
- 7. Develop a working knowledge of the techniques of cutter library use.
- 8. Develop skill at merging different Mastercam files into one.

Lecture Content

Introduction and overview of Mastercam and computer assisted parts programming Course requirements How Mastercam works Main menu Toolbar Secondary menu Prompt area File types Geometry construction Z depth Color Levels Construction planes Geometry planes Views Two-dimensional versus three-dimensional construction Points, lines, arcs, rectangles, fillet, splines, curves, chamfers Modifying geometry Break Trim Join X Form Rotate Translate Mirror Extend Special 2-d features Bolt circles Polar features Letters Basic surfaces Ruled Revolved Draft Swept Fillet Loft Trim / Extend / Offset surfaces Tool path Drill Contour Rough Finish Pocket Flowline Parameters Milling Drilling Turning Pocketin Post processors Doc files Fine tuning and editing

Lab Content

See Course Content.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture and demonstration using the computer and software. Supervised and guided lab activities on the computer using Mastercam.

Reading Assignments

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Writing Assignments

Proficiency demonstration in the performance of the instructional objectives

Out-of-class Assignments

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Demonstration of Critical Thinking

Quizzes; part programs; part designs; final exam

Required Writing, Problem Solving, Skills Demonstration

Proficiency demonstration in the performance of the instructional objectives

Textbooks Resources

1. Required Lin, SuChen Jonathon, and F.C. Tony Shiue. Mastercan Version 9 Mill and Solids, ed. Ann Arbor: Scholars International Publishing Corp., 2003 Rationale: -