MACH A142: MASTERCAM SOLIDS

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	095630 - Machining and Machine Tools
Units	2 Total Units
Hours	54 Total Hours (Lecture Hours 27; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

An intermediate course in CNC programming using the solids feature of Mastercam. This course will introduce students to solid modeling creation using Mastercam. Boolean addition and subtraction, as well as filleting, chamfering, and the machining of solids models. PREREQUISITE: MACH A133. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Create a part design in solids.
2. Drill and perform simple milling functions on solid parts.
3. Verify cutter path from solids generated programs.
4. Perform simple drill and machine functions.

Course Objectives

- 1. Recreate a part design in solids.
- 2. Edit a solid part design.
- 3. Drive milling tools on solid surfaces.
- 4. Drill and perform simple milling functions and solid parts.
- 5. Verify cutter path from solids generated programs.
- 6. Demonstrate accurate back plotting of tool paths on solid generated parts.
- 7. Perform blending and combining of solid shapes.

Lecture Content

Course Overview Introduction to solid modeling Basic features of solids Lab exercises Solids modeling techniques Primitive solids Sketched solids Edited solids Solid feature based construction Base feature Added feature Sketched solid modeling functions Extrude Revolve Sweep Loft Solid editing functions Fillet Chamfer Shell Boolean functions Create body Cut body Add boss Target body Tool body Generating toolpaths Rough pocket function Finnish parallel function Suppressing operations Highlight Rename Regen solids 2-D toolpaths generated from solids Contouring Pocketing Drilling 3-D toolpath from solids Surface rough Surface finish Drawing from solids Standard views Section views Detail views File conversion Surfaces Solids Parasolid Iges Toolpath verification True solids Use of stl files

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 lab activity on the latest version of Mastercam

Reading Assignments

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Writing Assignments

Demonstrate writing and editing of CNC solids programs

Out-of-class Assignments

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Demonstration of Critical Thinking

Midterm, projects, and final exam

Required Writing, Problem Solving, Skills Demonstration

Demonstrate writing and editing of CNC solids programs

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: -