MACH 2635: CNC Precision Machining Lathe

A. COURSE DESCRIPTION

Credits: 4
Lecture Hours/Week: 1
Lab Hours/Week: 6
OJT Hours/Week: *.*

Prerequisites:
This course requires all 10 of these prerequisite categories
1. MACH 1601 - Introduction to Precision Machining
   And
2. MACH 1610 - Precision Measuring and Gauging
   And
3. MACH 1615 - Precision Machining Processes
   And
4. MACH 1625 - Engineering Drawings 2
   And
5. MACH 1630 - Introduction to CNC Theory
   And
6. MACH 1642 - CNC Operations 1
   And
7. MACH 1643 - CNC Operations 2
   And
8. MACH 1650 - Introduction to EDM
   And
9. One of these two
   MACH 1605 - Engineering Drawings 1
   CMAE 1510 - Print Reading
   And
10. One of these two
    MACH 1661 - Introduction to CAD/CAM
    MACH 1662 - Introduction to CAD/CAM + 3D Printing

Corequisites: None
MnTC Goals: None

This course will focus on CNC Lathe operations used to support manufacturing and tool making. Each student will manufacture several project parts from a lathe in this course. The student will be responsible for the proper set-up and operation of the Lathe and all cutting tools. The finished project must produce an accurate part according to the Tolerances applied in the part print. The student will inspect their own parts, and submit the part and the inspection report to the Instructor. (Prerequisites: MACH1601, MACH1605 or CMAE1510, MACH1610, MACH1615, MACH1625, MACH1630, MACH1642, MACH1643, MACH1650, and MACH1661 or MACH1662 or equivalent) (4 Credits: 1 lecture/3 lab)

B. COURSE EFFECTIVE DATES: 01/27/2016 - Present
C. OUTLINE OF MAJOR CONTENT AREAS
1. Safety and set-up for CNC Lathes
2. Learn & Apply G & M code programming
3. Learn & Apply Conversational programming
4. Develop proficiency in CNC Lathe operations
5. Apply machining formulas & reference materials
6. Practice precision measuring and inspection methods
7. Develop 5-S program skills

D. LEARNING OUTCOMES (General)
1. Identify safety rules for operating machinery, including proper eye wear and clothing
2. Use CAD & CAM system to design and program project features
3. Demonstrate proper tool set-up, and Tool Touch-off data input on CNC Lathes
4. Demonstrate knowledge of insert selection data for Lathe cutters
5. Demonstrate competency as a CNC Lathe operator
6. Demonstrate proper selection and accurate use of precision measuring tools for inspections
7. Manufacture project components using CNC Machine Tools and handwritten programs
8. Manufacture project components using CNC Machine Tools and CAM programming
9. Understand the meaning of the following Programming codes for Lathe turning: G00, G01, G02, G03, G04, G28, G40, G41, G42, G50 G54, G55, G56, G57, G58, G59, G70, G71, G72, G76, G80, G81, G82, G83, G84, G96, G97, G98, G99 U, W, X, Z
10. Understand the meaning of the following M-codes for the lathe: M00, M01, M2, M3, M4, M5, M6, M8, M9, M19, M30, M99
11. Apply the G & M-codes in handwritten MDI (MANUAL DATA INPUT) programs to machine the course projects
12. Demonstrate how to "Edit" an existing program at the machine control
13. Perform transfer and loading of programs from a computer to the machine control
14. Demonstrate the ability to successfully create a conversation program
15. Show an ability to navigate the different "screens" on each of the different CNC Lathes
16. Clean and lubricate all machines (5-S PROGRAM)

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
None

F. LEARNER OUTCOMES ASSESSMENT
As noted on course syllabus

G. SPECIAL INFORMATION
None noted