

# Minnesota State College Southeast

## MACH 2638: CNC Precision Machining Lathe Operations

### A. COURSE DESCRIPTION

Credits: 2

Lecture Hours/Week: 1

Lab Hours/Week: 1

OJT Hours/Week: \*.\*

Prerequisites:

MACH 2636 - CNC Machine Tool Lathe Operations

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 and the student will inspect their own parts. (Prerequisites: MACH 1601, 1605, 1610, 1615, 1625, 1630, 1641, 1650 & 1661 or equivalent and successful completion of MACH 2636) (2 credits: 1 lecture/1 lab)

**B. COURSE EFFECTIVE DATES:** 05/24/2016 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Safety considerations in CNC set-up & operations
2. Learning G & M code programming language
3. Use technical data to select proper tooling
4. Precision measurement
5. Math calculations related to speed and feed selections
6. 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 knowledge of speed and feed selection related to part materials
6. Demonstrate proper selection and accurate use of precision measuring tools for inspections
7. Manufacture project components using CNC Machine Tools
8. Understand the meaning of the following programming codes for lathe turning: G00, G01, G02, G03, G04, G20, G21, G28, G40, G41, G42, G54, G55, G56, G57, G58, G59, G70, G71, G72, G74, G76, G80, G81, G82, G83, G84, U, W, X, Z
9. Understand the meaning of the following M-codes for the lathe: M00, M01, M2, M3, M4, M5, M6, M19, M30, M98, M99
10. Apply the G & M-codes in hand written MDI (MANUAL DATA INPUT) programs to machine course projects
11. Demonstrate how to "Edit" an existing program at the machine control using MDI
12. Use the different methods of transfer and loading of programs from a computer to the machine control: flash drive transfer, RS232 cable transfer, network Wi-Fi search & loading
13. Demonstrate the ability to successfully create a conversation program and machine a part to correct dimensions
14. Show an ability to navigate the different "screens" on each of the different CNC lathes
15. 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