

Minnesota State College Southeast

MACH 2660: Advanced CAD/CAM I

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

This course will familiarize the student with advanced computer aided drafting and computer aided machining using CNC Mills and CNC Lathes. Students will design, and manufacture projects using the Master CAM software computer program to communicate with Computer Numerical Control machine tools. Students will work with 2D, and 3D-solid geometry types. (Prerequisites: MACH1601, MACH1605, MACH1610, MACH1615, MACH1625, MACH1630, MACH1641, MACH1650 & MACH1661 or equivalent) (3 Credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 01/27/2016 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Drafting principles using a CAD system
2. File folder management in a CAD system
3. 2-D & 3-D model design
4. Application of Computer Aided Machining (CAM)
5. Communication systems between CAD/CAM and Machine Tool

D. LEARNING OUTCOMES (General)

1. Design and draw multiple views of a metal stamping die tool
2. Draw a front view stack-up of a complete die set with punch & die components
3. Create tool path for the drill, mill, and tap operations to build the tooling
4. Write an NC file by choosing the correct post processor related to specific CNC controls
5. Use the "Verify" graphics operation in Master CAM to check the tool path operations
6. Learn to organize and manage drawings and NC files with the Windows file/folder system
7. Understand how to use the NC editor to transfer the NC file G-code to the CNC mill & lathe
8. Understand the "download" and "upload" functions in program data transfer
9. Create 3-D drawings using the surfaces and solids feature of Master CAM
10. Select the proper order of operations related to the design needs of a product
11. Perform a "download" of the NC file G-code to the CNC mill & lathe using the Master CAM editor transmit function
12. Create 3-D surface tool paths
13. Machine a 3-D feature in the CNC Mill
14. Demonstrate proper tool set-up using the CAT 50-taper tool collets
15. Perform manual tool length touch off using the "hand wheel" mode
16. Enter tool length offset in the control monitor under the proper tool length register
17. Select and verify a program with "dry run" or "single block" options in the CNC machine

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted