

Minnesota State College Southeast

MACH 1662: Introduction to CAD/CAM + 3D Printing

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 computer aided drafting, computer aided machining and 3D printing. Students will learn the design drafting process of the CAD computer program. Students will learn the Computer Aided Machining (CAM) process of the software to produce Machining Tool paths and to write G-code programs. Students will learn how to import CAD models into 3D printing slicing software and how to print the model. This course can be taken as an elective to other programs, or as a mid-year start for the CNC Machine Tool program. (Prerequisite: none) (3 Credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 04/16/2020 - 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
6. 3D printing from 3D CAD models

D. LEARNING OUTCOMES (General)

1. Apply all safety standards to machining applications and selections
2. Draw 2-D geometry features using a CAD drafting software
3. Create 3-D features for part design using the Extrude tools of the CAD system
4. Create 2-dimensional drawing prints on Title Block format
5. Apply current drafting principles to views and dimensions
6. Select appropriate tooling for a machining application
7. Calculate tool speeds & feeds for a specific machining application
8. Use the Windows file management system to save geometry files
9. Use the CAM software to generate tool path files
10. Use the CAM software programming system to write an NC file
11. Use the Windows file management system to save NC program files
12. Select proper cutter compensation for a machining application
13. Generate the graphic verification of tool path files in the CAM software
14. Understand "post processor" selection for machining
15. Use 3D printing slicing software to slice a CAD model for 3D printing
16. Adjust slicing settings in the 3D printing software
17. Print out 3D model using a 3D printer
18. Complete all assigned drawings, tutorials, tests, and other tasks

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted