South Central College

MTT 1220 CNC Programming I

Course Outcome Summary

Course Information

Description This course prepares students to become an introductory (Computer Numerical Control (CNC) machine operator. The topics include machine safety, proper tool setup, tool/work offsets and CNC controller layout. This also includes a basic introduction to Mastercam. (Prerequisites: MTT 1110 and MTT 1120)

Total Credits 4

Total Hours 96

Types of Instruction

Instruction Type	Credits/Hours
Lec	2/32
Lab	2/64

Pre/Corequisites

MTT 1110 and MTT 1120

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Demonstrate CNC mill and CNC lathe safety

Learning Objectives
Demonstrate basic OSHA requirements
Demonstrate proper chip handling and maintenance
Exhibit general shop safety

2. Demonstrate safe CNC start up procedures

Learning Objectives
Conduct proper machine power up restart

Execute use of moving machine axis
Conduct proper and safe machine shut down procedures

3. Describe CNC machine types

Learning Objectives
Identify CNC mill and CNC lathe
Identify Wire and Sinker Electrical Discharge Machine (EDM)

4. Edit CNC program

Learning Objectives
Modify CNC lathe and mill program content
Modify CNC lathe and mill offsets

5. Use machine controls

Learning Objectives
Demonstrate offset adjustments
Enter tool diameters

6. Interpret CNC program

Learning Objectives
Describe units of measure
Demonstrate proper spindle speeds, feedrates and coolant use
Describe positioning system, axis destination movement and end of program code

7. Demonstrate program uploading

Learning Objectives
Execute program simulation to verify program
Execute upload or transfer of program to the CNC control

8. Use CNC controller

Learning Objectives
Describe machine control modes
Adjust wear offsets to produce accurate part dimension

9. Discuss Mastercam

Learning Objectives
Explain Master Cam usage in metalworking
Explain Master Cam abilities
Explain proper file management

10. Apply CNC G&M programming code to basics shapes

Learning Objectives
Illustrate ways to create geometry using lines, arcs and splines
Identify icon locations, screen layout and drop down menus

11. Use canned cycles to machine basic print features

Learning Objectives
Select proper canned cycle for machining operation
Identify milling, drilling and internal boring toolpaths

12. Use Advanced G&M code techniques

Learning Objectives
Use circular interpolating tool paths
Use bar feeder for automatic operation

13. Demonstrate proper tool setting for the lathe and mill

Learning Objectives
Apply presetter technology

Identify type of tool presetting in controller

14. Demonstrate proper work coordinate setting

Learning Objectives

Use appropriate dial indicators to set work coordinate
Demonstrate setting work coordinate and tool length offsets

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

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