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

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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**

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Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

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