

# SkillsUSA at Luzerne County Community College

Date: January 4, 2024

## Contest: CNC Milling

### Scope of the Contest

#### Knowledge:

This contest will include a written theoretical examination and also a project which will evaluate the contestant's knowledge in CNC Milling

#### Examination:

This part of the contest will consist of 30 multiple choice, fill in the blank, or true and false questions. Students will have the opportunity to only reference the Machinery's Handbook. Questions will be in the following categories: Identifying Program Codes, safety, and sample programming interpretations.

#### Project:

1. Manufacture a project from a working drawing.
  - a. Participants will be required to perform the proper CNC Milling duties:
    - i. Programming
      1. Verify toolpaths without the use of CAM
      2. Enter program on the control.
      3. Utilize cutter compensation
      4. Firm understanding of all codes
    - ii. Set Up
      1. Align Vise
      2. Install tooling in correct tool holders
      3. Zero Set/Homing/Tool Offsets
    - iii. Operations
      1. Cycle start up
      2. Perform CNC duty as per stated on a working drawing:
        - a. Milling a part to length
        - b. Milling a profile that includes fillets, arcs, and angles.
        - c. Milling a keyway slot
        - d. Drilling

### LCCC to provide the following:

#### Machinery:

1. CNC Vertical HAAS Milling Machine.
2. Bridgeport type milling machine equipped with Conversational 2 Axis Control.
3. HAAS Simulators

Theory:

1. Machinery's Handbook
2. Reference Library
3. Calculator
4. Pencil
5. Paper

Instrumentation:

1. Granite Surface Plate
2. Height Gage
3. Scriber
4. Steel Rule
5. Optical Punch
6. Ball Pean Hammer
7. Combination Square
8. Last Word Indicator
9. 0-6 Dial Calipers

Tooling:

1. 4x6 Vise
2. Steel Parallels
3. Edge Finder
4. Milling Cutters
5. Center Drill
6. Drill Index
7. Counterbore
8. Counter sink
9. Reamer
10. Tap
11. Tap guide
12. Tap Handle
13. File

Other:

1. Maple 4 Station Laboratory Table
2. Safety Glasses
3. Hearing Protection

**Contestant should be prepared with:**

1. Appropriate Personal Protective Equipment. (Follow all standards and safety currently practiced at your institute)
2. Machinery's Handbook (It is recommended that contestants use their own with personal bookmarks)