



CNC PROGRAMMER

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with precision machining technology as the occupational objective.

CLOTHING REQUIREMENTS

Official SkillsUSA khaki work shirt and pants, black or brown leather work shoes, and safety glasses with side shields or goggles. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.)

NOTE: At the district level if a student is not able to wear the official SkillsUSA attire he/she may wear an outfit that would be acceptable in their specific field of study. Please keep in mind that official SkillsUSA attire will be required at the state and national level.

EQUIPMENT AND MATERIALS SUPPLIED BY HOST

1. Work area
2. G and M codes list
3. Technical drawing and documents corresponding to the simulated machined component
4. Model or drawing of a Milling component and/or turning component (Loaded via USB thumb drive)
5. Computer with MasterCam and CAD software

EQUIPMENT AND MATERIALS SUPPLIED BY CONTESTANT

1. All students must have a one-page, typewritten résumé
2. Signed Proof of Training form
3. Pencils
4. Scientific Calculator
5. Haas Manual
6. Machinery's Handbook
7. Optional - Laptop computer & charging cord with CAD/CAM software installed (MasterCam or Fusion 360)
 - a. Laptop must be capable of joining host's school's WiFi network
 - b. CAD/CAM software must be able to post-process a G-code program for a Haas CNC Mill and a Haas CNC Lathe

DEFINED BY THE NATIONAL COMPETITION REGULATIONS)

(District Competitions are meant to be a scaled down version of National Competition. It is important for the students to participate in a competition that will reflect a cross-section of the industry skills needed to prepare them for the state and national levels)

KNOWLEDGE PERFORMANCE

Contestants will demonstrate knowledge in CAM programming for NIMS related mill parts, CNC programming skills using a HAAS Controller from a NIMS related lathe drawing and ability to create a setup sheet or router. A test will include related knowledge and skill in the areas of engineering drawing interpretation, GD&T, technical math, machining practices, use of precision measuring tools.



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SKILLS PERFORMANCE

1. Each contestant will be provided with the following in order procedure a CAD/CAM generated part program:
 - a. Instructions
 - b. Dimensional Drawing and/or part to be programmed specifications
 - c. Resource List
2. Competitor skills to be demonstrated and evaluated shall include:
 - a. Process plan development
 - b. Creation and/or modification of CAD geometry and Solid metals
 - c. Creating 2 and/or 3 axis toolpaths
 - d. Program simulation
 - e. Post process NC program files
 - f. Troubleshoot and debug NC program(s)
3. Competitor deliverables:
 - a. NC Program files
 - b. Tool list(s)
 - c. Setup sheets(s)
 - d. Process Plan



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CNC PROGRAMMING SCORE SHEET

Item Name	Description	Possible Points
Written Test		20
Tool List, Set-up Sheet, Process Plan	(10 points each)	30
Practical Application		50
	Subtotal = 100	
No Resume	Deduction -10	
Safety Penalty	Deduction - 10	
Clothing Penalty	Deduction -10	
	TOTAL	

Note: No cell phones or other electronic devices may be used at any time during a competition; this includes using a calculator function on a cell phone for competitions in which calculators are permitted.

Note: Scorecards should only be used as guidance. Changes may occur.