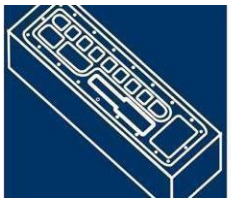
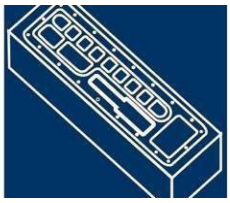
LEVEL UP
2026 - 2027

NYS SkillsUSA



AUTOMATED MANUFACTURING TECHNOLOGY



PURPOSE

To evaluate each competitor's preparation for employment in automated manufacturing and the team approach to problem-solving in a work environment. To recognize outstanding students for excellence and professionalism in automated manufacturing technology.

CLOTHING REQUIREMENTS

NYS SkillsUSA Weld/Mach Attire:

- White crew neck short- sleeved T-shirt
- Work pants
- Leather or steel toed work shoes
- Safety glasses or goggles, (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.)

Note: Safety glasses must have side shields or goggles.

Note: Contestants must wear their contest clothing to the contest orientation meeting. Also bring #2 pencil, resume, and safety assurance form

ELIGIBILITY (TEAM OF THREE)

Open to a team of three (3) active NYS SkillsUSA members enrolled in programs with precision machining, automated manufacturing, or CAD/CAM or CNC as an occupational objective. Each state may send one high school and one college/postsecondary team.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. Part(s) design
   b. Competition packet
   c. Blank diskette or USB thumb drives
   d. Material for machining
2. Supplied by the competitors:
   a. All competitors must create a one-page resume. See "Resume Requirement" see below for guidelines.
   b. CNC machining center with:
      1. Machine vise
      2. Hold down and clamps
      3. Tool holders
      4. End mills
   c. Two (2) computers:
      1). One computer loaded with CAD software for the CAD program
      2). One computer loaded with software for the CAM program. Licensed versions of the above CAD and CAM software must be available at the start of the orientation/practice session on Wednesday for loading onto the NYS Chair/committee's computer

      Note: Computers must be preloaded with the fully licensed CAD, CAM and CNC Motion software and competitors must have administrative rights to the computers to implement changes if required. All software should be pre-installed and tested prior to arriving at the competition to ensure the system will run offline. *

   d. One 6" dial or digital veneer caliper
   e. One dial indicator and appropriate holder to fit mill.
   f. One calculator
   g. One complete set of machinist parallels
   h. One soft-face hammer
   i. One 6" or 12" steel rule
   j. Safety glasses with clear lenses
   k. Each team must provide two (2) USB memory devices for submitting work to judges
   l. Each team must provide a machinist handbook
   m. Each team is allowed to bring their own appropriately sized end mills
   n. Toolbox with standard machinist essentials

Note: Only the above-listed items will be allowed in the contest area during the competition.

RESUME REQUIREMENT

Competitors must create a one-page resume to submit at orientation.

PROHIBITED DEVICES

Cellphones, electronic watches, and/or other electronic devices not approved by a competition's national technical committee are ***NOT*** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

Penalties for Prohibited Devices

If a competitor's electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the Director of the SkillsUSA Championships. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor's scores maybe removed.

SCOPE OF THE COMPETITION

The competition will test the ability to perform, exhibit, and compile skills and knowledge from the following list of competencies determined by the NYS SkillsUSA Automated Manufacturing Technology technical committee.

KNOWLEDGE PERFORMANCE

The competition includes a NYS SkillsUSA Professional Development test that will be taken at orientation.

SKILL PERFORMANCE

The competition includes a team skill performance for three students and evaluates teams for employment in integrated manufacturing technology fields of computer-aided drafting/design (CAD), computer-aided manufacturing (CAM), and computer numerical controlled machining (CNC).

COMPETITION GUIDELINES

1. All equipment provided by the NYS chair/committee will be in place and set up before the competition begins. On the Wednesday before the competition, there will be an orientation/practice for all teams. Teams must bring their computers and above-listed equipment to the orientation on Wednesday. Teams will not be allowed to remove their computers from the competition area until after they have finished competing on Thursday. ***Note: Tampering with or removing any equipment provided during the competition is grounds for disqualification.***
2. Teams will be comprised of three members.
3. The teams will be presented with dimensional drawing(s) of part(s) to prototype during the contest.
4. The CAD operators construct the part geometry; the Cam operator generates the tool paths; and the CNC operator sets up and machines the part. When a team member has spare time, he or she will help others in the group.
5. One person should not dominate a team by doing the CAD drawing, the CAM toolpath, and running the CNC machine while using the other members simply as support. The competition is designed to promote creativity in the organization of production responsibility.
6. All group members are responsible for double-checking each other's work and quality control.
7. When the teams finish machining the prototype part(s), they will present it to the client (judges). At this time, the teams will be presented with a second drawing(s) as either a change order or as an additional part(s).
8. Each team will be issued a notebook. Included in the packet will be all the necessary information and forms to complete the project. These forms will not be highly specific but will coach the teams.
9. All packets, forms, and drawings must be turned in to the judges at the end of the competition.

STANDARDS AND COMPETENCIES

MFG 1.0 — Perform mathematical and measurement calculations used in automated manufacturing situations

1.1. Measure work pieces to the nearest.001 inch
1.2. Calculate CNC speed and feeds
1.3. Calculate stock utilization and setup
1.4. Calculate tolerances MFG 2.0 — Design, sketch, and plan machine work to U.S. National CAD Standards

2.1. Transfer information from provided drawing to CAD drawing
2.2. Create CAD file for manufacturing using standard CAD terminology and standard practice Initiate
2.3. manufacturing documentation process
2.4. Generate a process plan
2.5. Plot a CAD file
2.6. Export a CAD file
2.7. Process Engineering Change Orders (ECO)
2.8. Repeat steps as necessary to accommodate ECO

MFG 3.0 — Create a toolpath (CAM file) and the CNC code to related duty tasks of the National Institute for Metalworking Skills (NIMS) Duties and Standards for Machining Skills, Level I

3.1. Create process plan (job plan)
3.2. Read-in CAD export file
3.3. Create tool path
3.4. Verify tool path
3.5. Create CNC code
3.6. Send CNC code to machine tool
3.7. Process Engineering Change Orders (ECO)
3.8. Repeat steps as necessary to accommodate ECO

MFG 4.0 — Perform CNC machining functions given a scenario to the related duty tasks of the National Institute for Metalworking Skills (NIMS) Duties and Standards for Machining Skills, Level I

4.1. Verify CNC file existence
4.2. Verify tool path
4.3. Set up fixture(s) and tooling on machine
4.4. Set up part(s) on mill
4.5. Set all offsets and tooling
4.6. Adjust machine speeds and feeds as needed
4.7. Complete an in-process quality assurance process
4.8. Perform tool changes
4.9. Perform multiple machining operations in one setup
4.10. Demonstrate proficiency in using a CNC machine tool and produce part(s)
4.11. Use Total Quality Management practices to verify process and part
4.12. Process Engineering Change Orders (ECO)
4.13. Repeat steps as necessary to accommodate ECO MFG 5.0- Perform and inspect part(s) using Total Quality Management process

5.1. Verify part(s) to provided standards
5.2. Verify part(s) to ECO standards
5.3. Document process of verification and inspection

MFG 6.0 — Demonstrate safety practices in a working situation to the related duty tasks of the National Institute for Metalworking Skills (NIMS) Duties and Standards for Machining Skills-Level I

6.1. Carry out assigned responsibilities while adhering to safe practices in accordance with OSHA requirements and guidelines
6.2. Document safety activities as required
6.3. Demonstrate safety procedures in running and programming a CNC machine tool