



Precision Machine Overall and Job Specific

2024 SkillsUSA Michigan State Championships Contest Description Task and Materials List

To: All State Contestants (Overall Precision Machining & Job Specific Areas)

Subject: SkillsUSA State Competition Information

Dear SkillsUSA State Contestant(s),

On behalf of the Precision Machining Technical Committee, I would like to congratulate you for qualifying for the state competition. You have not only proven your ability to compete and succeed against many other students within your region but also to demonstrate the type of leadership qualities that SkillsUSA was founded on.

The Precision Machining Technical Committee has worked very diligently over the past several years to make this competition the best it can be. In setting our goal on this site, we have changed the overall look of the state contest somewhat this year in an attempt to prepare all of the contestants for the contest.

The SkillsUSA competition for **all** Precision Machining contestants (Overall Precision Machining & Job Specific Areas) will take place at Grand Rapids Community College (GRCC), (see www.miskillsusa.org website for address and directions).

2024 SkillsUSA Precision Machining Contest:

CONTEST LOCATION:

Grand Rapids Community College (GRCC)
Applied Technology Center (ATC)
151 Fountain NE
Grand Rapids, MI, US
(616) 234-GRCC (4722)
<http://www.grcc.edu/>

RESUME:

Each contestant must submit a one-page word processed printed resume before the contest start at the contest site (present to contest coordinator, not judges). The resume is no longer submitted online. The resume needs to be turned in at 8:00 on Saturday when the contest starts (during your sign-in time period). This is the **only** time that resumes can be turned in without a scoring penalty. Failure to do so will result in a 10 point penalty.

Friday, April 12

In an effort to continuously improve the competition and make the experience a positive and safe one for all involved, we have scheduled a time for you to visit the competition area before the Saturday event in an effort for you to familiarize yourself with the machines that you will be operating for Saturday's contest. Machine familiarization viewing timeframe is from 3:30 p.m. till 6:00 p.m. for **all** contestants (overall & job specific). The contestants will be allowed to evaluate the machines on the shop floor (note safety rules mentioned later in this document will apply). Students are allowed to power up machines and turn them on but are not allowed to break a chip with any cutting tools by machining a piece of stock or scrap material or making a spark by touching off on a work piece with the surface grinders. Advisors are welcome to assist their students for this portion of the contest. (proper safety items are a must!)

Prior to the contest starting Saturday morning, the judges and technical committee will be answering all safety rules and contest information/questions for Saturday's competition. **ALL** contestants (overall & job specific) **MUST** sign and agree to **ALL** of the "*competition rules*", "*general safety rules*", and "*clothing/dress requirements*" that are listed below before competing in their respected competition area on Saturday. Each contestant must sign a sheet indicating that they have read, understand, and agree to these terms and conditions before the start of the competition on Saturday.

NOTE : Since the Precision Machining state contest starts on Saturday, we have NOT arranged for transportation for the competitors on Friday, April 12, 2024 to come to GRCC in order to familiarize themselves with the machinery. Advisors and competitors will need to provide their own transportation to and from GRCC on Friday ONLY if the competitor chooses to preview the shop and equipment. NOTE: This will be the only time for each competitor to run the machinery prior to all contests starting on Saturday morning.

***NOTE: Friday's machine familiarization is NOT mandatory and any contestant who doesn't attend this opportunity will NOT be penalized (contest scoring) for not attending.**

Saturday, April 13

Contest starts at 8:00 a.m. sharp! Make sure that **all** contestants (overall & job specific) are ready to jump on the **first** round of buses leaving the Amway Grand Plaza Hotel heading over to GRCC to ensure from not being late. This 8:00 start time is for **all** contestants (overall & job specific). The technical committee will provide lunch at @12:15 for all Overall Contestants and @1:00 for Job Specific Contestants at GRCC. Lunch is provided *free* of charge to **only** participating contestants and to all judges.

Note: The Grand Rapids Community College will open the doors to **all** contestants at 7:30 a.m. (All registered overall precision machining and job specific contestants). Advisors are welcome to accompany their students at this time as well.

NOTE: We will be using GRCC's machine shop equipment that they have on their shop floor. In an attempt to make the contest as fair as possible, each contestant will be assigned a certain machine tool in which they will be responsible for knowing how to safely and properly operate for Saturday's contest. A machine number will be assigned to each contestant as they sign in for their respective contest areas on Saturday morning.

Overall Contestant Schedule:

8:00	Final Orientation Safety Attire Check Attendance Called Machine Set-up
8:30	Machining Competition Begins - Overall Contestants
12:15-12:45	Lunch for Overall Contestants (on site at M-TEC)
1:00-4:00	Continue Competition -Overall Contestants
4:00	Debriefing

Job Specific (Mill, Lathe, Bench & Grind) Contestant Schedule:

8:00	Orientation Safety Attire Check Attendance Called
8:30	Competition Begins - Inspection, Written, & Professional (Job Specific Contestants)
1:00-1:30	Lunch for Job Specific Contestants (on site at GRCC)
1:30-1:45	Machine Set-up
1:45-3:15	Competition Begins - Machining of Part (Job Specific Contestants)
3:15-4:00	Shop Clean up
4:00	Debriefing

Note: There may be an unannounced change(s) in scheduling on the day of the competition due to uncontrollable circumstances (ex: machine availability, machine failure, tool breakage, etc...) which may cause a necessary schedule change for some/all contestants.

Competition Schedule - Overall Contestants

Student ID #	Mill	Lathe	Bench/Grind	Lunch	BP, Shop Math, Theory	Inspection	Interview	
1	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
2	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
3	8:30-9:30	1:00-2:00	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
4	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
5	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
6	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
7	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
8	8:30-9:30	9:45-10:45	11:00-12:00	12:15-12:45	1:00-2:00	2:00-3:00	3:00-4:00	
10	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
11	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
12	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
14	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
15	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
16	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
17	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
18	9:45-10:45	11:00-12:00	8:30-9:30	12:15-12:45	2:00-3:00	3:00-4:00	1:00-2:00	
19	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
20	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
21	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
22	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
23	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
24	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
25	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	
26	11:00-12:00	8:30-9:30	9:45-10:45	12:15-12:45	3:00-4:00	1:00-2:00	2:00-3:00	

Competition Schedule - Job Specific Areas

Student ID #	Inspection	BP, Shop Math, Theory	Professi onal Intervie w	Lunch	Mill	Lathe	Bench/ Grind	Shop Clean Up
27-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
28-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
29-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
30-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
31-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
32-M	8:30-9:45	10:00-11:15	11:30-12:45	1:00-1:30	1:45-3:15			3:15-4:00
33-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
34-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
35-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
36-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
37-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
38-L	11:30-12:45	8:30-9:45	10:00-11:15	1:00-1:30		1:45-3:15		3:15-4:00
39-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00
40-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00
41-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00
42-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00
43-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00
44-B	10:00-11:15	11:30-12:45	8:30-9:45	1:00-1:30			1:45-3:15	3:15-4:00

Contest Information:

To make certain that all contestants have the same fair advantage in this year's contest, the technical committee has decided to devolve pertinent information regarding this year's competition.

PLEASE CAREFULLY NOTE THE FOLLOWING INFORMATION:

There will be six rounds of competition this year:

1. Blueprint Reading, Related Technical Shop Math, and Shop Theory = All Contestants (Overall & Job Specific Contestants)
2. Inspection = All Contestants (Overall & Job Specific Contestants)
3. Manual Milling = Overall Contestants & Job Specific Mill

4. Manual Turning = Overall Contestants & Job Specific Lathe
5. Drill Press & Surface Grinder = Overall Contestants & Job Specific Bench & Grind
6. Professional Interview

*Rounds #1 thru #6 will all be held on Saturday.

Blueprint Reading, Related Technical Shop Math, Shop Theory = All Contestants (Overall Contestants & Job Specific Contestants) will be asked to answer written questions based on all standard machine shop knowledge as it relates to the topics of the contest.

Inspection = All Contestants (Overall Contestants & Job Specific Contestants) will be asked to accurately measure/inspect several machined parts to a specific tolerance. All aspects of standard measuring instruments will be used. (both inch & metric)

Manual Milling = Overall Contestants & Job Specific Mill. Material: T6-6061 Aluminum. Tooling: H.S.S. and Carbide Cutters

Manual Turning = Overall Contestants & Job Specific Lathe. Material: T6-6061 Aluminum. Tooling: H.S.S. and Carbide Cutters

Drill Press & Surface Grinder = Overall Contestants & Job Specific Bench & Grind. Material: 1018 C.R.S. Tooling: H.S.S. & Aluminum Oxide grinding wheel = 46-grit. **NOTE:** There will be only one piece of material given to each contestant. This same piece of stock will be used on both machines. Contestants should be familiar with grinding flat, parallel, perpendicular, and angled surfaces using a combination of angle plates, precision vises, and/or "V" blocks.

Competition Rules: = All Contestants (Overall Contestants & Job Specific)

- The SkillsUSA Leadership Test will determine the overall winner in the event of a tiebreaker.
- Surface finish will determine the overall winner in the event of a second tiebreaker.
- Write contestant #'s on the part(s) after the time has been called (stopped) for each round.
- Turn in completed parts with the blueprints to the judges. Do not put your name (only contestant ID #) on any of the drawings, blueprints, or written materials throughout the contest.
- Bathroom breaks are at your own cost of time during the competition. Ask the judges for help if you need something or have a question about the machine and/or blueprints.
- After the contest is over, your parts will be returned back to you without the score sheets.
- You will only be given one (1) piece of material for each round of competition. Check raw piece of stock for correct dimensions before machining it, no new parts will be replaced after a machine cut has been made on the work piece.
- In the event that you break a cutter or damage the tooling, you will not be given additional tooling.
- In the event that a machine malfunctions, you will be given additional time to complete the part, if you have properly notified the judge(s) in that area.
- Calculators (NO cell phones will be allowed to be used as a calculator) can be used during the contest. Before each round of competition, you will be allowed to do as much machine set-up as possible without breaking a chip or making a spark. (Only exception surface grinders may be powered up to dress the grinding wheel)

- Contest is based on the number of points. Higher point values will be awarded to tighter tolerances. Overall winner is the contestant with the highest point score.
- Contest is not based on how much you get done, but rather how much is done right - within tolerance in order to receive any possible points.
- Time will be announced prior to 5 minutes left in the competition for each round. No work will be permitted after time is called with the exception of identifying the part number, deburring the part, cleaning the machine, and returning tools and materials.
- Digital read outs will be permitted on the mill and lathe (if available).
- Carbide tooling will be provided to all contestants for turning and milling.
- Additional high-speed steel tooling will be available as required by the project.

!! **SAFETY RULES** !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

To comply with Skills USA and Grand Rapids Community College's (GRCC) safety rules, you will need to wear approved safety glasses (side shields **ARE** necessary on prescription glasses), short-sleeved shirt with the shirt-tail tucked in, long pants with absolutely no designer cuts or holes in the pants, work boots with laces tied completely, rings, watches, and all jewelry removed, and long hair must be tied up. **No exceptions to this rule will be made either Friday or Saturday.** You will not be allowed in the competition area unless you comply. *This goes for advisors also.*

General Safety Rules: = All Contestants (Overall Contestants & Job Specific)

- Safety glasses with side shields must be worn at all times throughout the whole contest even during machine rotations and clean up.
- All jewelry must be removed from the hands, neck, wrists, and ears if dangling. Clothing must protect body, legs, and feet. Shirts must be tucked in and short sleeves must be worn.
- Work boots must have a leather-upper and have hard soles. (No tennis shoes)
- No food or drink will be permitted on the shop floor.
- Hair that is 3 inches over the collar in length must be confined with a hair net, rubber band, ball cap, or equivalent.
- Students are responsible for proper operation and clean up of the machines.
- Only one person operates the machine at any one time. Students will never leave a machine while it is running/operating.
- Report all machine and tooling breakage to the judges.
- Absolutely no conversation is allowed with other competitors during the contest.
- Attend to all rules and specifications within the scope of the contest.

Clothing/Dress Requirements: = All Contestants (Overall Contestants & Job Specific)

- Must have hard soled-leather upper work boots. (No tennis shoes, sandals, cowboy boots, dress shoes, loafers, work shoes, etc...)
- Must have OSHA approved safety glasses (Z87+ rated) 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 over-the-eye goggles.
- Contestants must wear long denim jeans or work pants with no holes that cover the ankles.
- Contestants must wear the official SkillsUSA contest Khaki short-sleeved work shirt that must be tucked in. (please see below for description, no T-Shirts)
- Contestants must wear a black or brown colored belt.

****Contestants will NOT be allowed to work if they do not have proper safety attire, foot wear, and eye protection!****

Equipment and Materials:

Supplied by the technical committee.

- All necessary machines, working-holding devices, and work-piece materials.
- All necessary hand tools and precision measuring instruments and gages needed by contestants and/or judges.
- All necessary work instructions to be used by contestants and/or judges.

NOTE: Contestants are **not** allowed to bring nor use any personal precision measuring tools or tooling during the contest. The only supplies and equipment that contestants are allowed to bring and use during the entire competition are the listed items in the “supplied by contestant” list below.

Supplied by the contestant:

- Must provide a resume (see above & below).
- Must provide own Machinery’s Handbook or Student Shop Ready Reference book. (if needed) **No photo copies of reference material or hand-written loose notes are allowed!**
- Must provide own calculator (trig functions are recommended -if needed) (NO cell phones)
- Proper dress/attire, safety glasses, and workboots. *ALL contestants (Overall Precision Machining & Job Specific Areas) must wear an official SkillsUSA short-sleeved Khaki work shirt. (See general safety notes and clothing/dress requirements)

Reminders:

We will be giving **all** the contestants (overall & job specific) the written portion(s) of the contest.

NOTE: Job specific contestants are expected to take the written test and the score that they receive will count towards their final score. This will include blueprint reading, related technical shop math, and shop theory.

NOTE: All contestants will be taking the SkillsUSA Leadership test on their own at the Amway Grand Plaza Hotel. We will **NOT** be administering this test over at GRCC this year.

Every contestant (Overall Precision Machining & Job Specific Areas) must submit a one-page word formatted printed resume before the contest start on Saturday at the contest site (present to contest coordinator, not judges). The resume is no longer submitted online. This is the only time that resumes can be turned in. Failure to do so will result in a 10 point penalty.

Every contestant (Overall Precision Machining & Job Specific Areas) must help and assist in the overall shop cleanup at their scheduled times on Saturday. Attendance will be taken after clean up is completed and this **will** reflect in a deduction of points

to that contestant's overall score if he or she was not present to help with clean up. If a contestant for **any** reason will be unable to attend the "shop cleanup", they must notify the contest coordinator (not one of the judges) to inform them about their inability to help out in the overall shop clean up duties and responsibilities.

A uniform is required for Saturday's competition; **all** contestants (not advisors) must wear the appropriate clothing. The appropriate clothing that the technical committee is proposing for this year's contest is the official SkillsUSA contest attire (just the shirt, not the pants). The shirt that the technical committee is referring to is the official SkillsUSA khaki short-sleeved contest uniform that they use at the national event -minus the pants. The contestant will still be allowed to compete if he/she does not have the official khaki work pants (reduced scoring points for clothing requirements) - the technical committee is not requiring the pants, just the work shirt for this year's competition. We are all trying to have our students looking sharp and feeling important. We are asking that all contestants come properly dressed on the day of the competition. (See above safety rules/dress requirements as it applies to the dress code/attire and personal safety/protection).

Here is the web link/URL if you need to purchase the proper required contest work shirt from the SkillsUSA online store. Khaki Shirt 100% cotton with SkillsUSA logo embroidered left chest (short-sleeve). Product Code: Carhartt Short Sleeve Work Shirt sku#101-06. Purchase Price = \$37.00 + shipping

<http://www.skillsusastore.org/products/shortsleeveuniform>

This year's contest will **NOT** be requesting that any contestant bring anything other than a smile on their face in order to compete on Saturday. This way neither Skills USA nor Grand Rapids Community College are responsible for stolen or lost items. This also makes for a much more fair competition because every contestant must use the same machines, tooling, and measuring instruments, etc... (Exceptions: contestants may bring a pencil, calculator (NO cell phones), and machinery's handbook or the *Shop Reference for Students and Apprentices Handbook*).

If any advisor has questions regarding the competition or tooling, please contact Duane Emig by email at emig.duane@sccresa.org. I can also be reached (810) 455-4304 between the hours of 7:45 am and 3:00 pm. Please be aware there may be revisions to follow as deemed necessary by the technical committee. These changes will be made as separate attachments to this original document. Please refer to the SkillsUSA Michigan website for other items that the Precision Machining Technical Committee has posted for your information at <http://www.miskillsusa.org>.

Please contact Duane Emig if you have specific questions and/or concerns.

Thank you and good luck to all the contestants,

Duane Emig

Duane Emig
Precision Machining Technical Committee
Precision Machining Chair
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(810) 455-4304
(810) 364-8139 fax

SCORECARD
Precision Machining Technology
Overall Competition

Items Evaluated:

Possible Points:

Related Written Tests (BP, Math, Theory)	200
Manual Milling Operation	200
Manual Turning Operation	200
Manual Drill Press & Surface Grinder Operation	200
Inspection	200
Resume	0 to -10
Clothing Penalty	0 to -50
Safety Penalty	0 to -1000

Total Possible Contest Points: 1000

SCORECARD
Precision Machining Technology
Job Specific Competition Area(s)

<u>Items Evaluated:</u>	<u>Possible Points:</u>
Manual Machining Operation(s)	600
(Manual Milling Operation) or (Manual Turning Operation) or (Manual Drill Press & Surface Grinder Operation)	
Related Written Tests (BP, Math, Theory)	200
Inspection	200
Resume	0 to -10
Clothing Penalty	0 to -50
Safety Penalty	0 to -1000
<u>Total Possible Contest Points:</u>	1000