

# Skills USA Washington 2018

## Machining

### Contest Information

The Precision Machining, CNC Milling, CNC Turning and CNC Technician contests will be held at Perry Technical Institute in Yakima on Friday April 20, 2018. It will be run by the Precision Machining and Manufacturing Program staff and students. The shop will open to contestants and instructors at 7:30am and check-in will start at 8:00am. The contest will begin at 8:30am and end at approximately 11:30pm. Contestants will be allowed to leave after they clean-up.

Itinerary of activities at Perry Technical Institute:

Friday April 20, 2018

|          |  |
|----------|--|
| 7:30am:  | Perry machine shop opens to students and advisors. |
| 8:00am:  | Contest registration begins                        |
| 8:30am:  | Contest start                                      |
| 11:30pm: | Contest finish (approximate)                       |

Machinery and tools will include:

- Engine lathe- Kent USA gear head lathe with a three jaw chuck.
- Vertical mill- Bridgeport style knee mill without digital readout or power feeds.
- Work piece inspection area will include all appropriate measuring tools need to complete the required measurements

What to Bring for the Precision Machining contest:

- Safety glasses
- 0-1" Micrometer
- 3/32"-3/8" allen wrench set
- 6" or 8" Calipers (Dial, Digital, or Vernier)
- File & deburring tools
- 8" Adjustable "Crescent" wrench or equivalent
- Calculator
- Edge finder
- Rag
- Paper & Pencil

What to Bring for the CNC contests:

- Safety glasses
- Calculator
- Paper & Pencil

Tools should be kept in a small container such as a small toolbox or even something as simple as a small cardboard box. All tools and toolboxes will be inspected when you check in.

## CLOTHING REQUIREMENTS FOR CONTESTANTS

Wear: Clothing safe and appropriate for a machining environment that does not identify the contestants name or school.

## INSTRUCTIONS TO CONTESTANTS

1. All contestants must be properly registered both with the State and National Skills USA organizations.
2. All contestants should check with their advisor for details of changes in contest, supplies, or equipment the contestant must bring to the contest.
3. Contestants must be at the contest site with all necessary supplies and equipment at the prescribed time for the contest briefing.
4. At the beginning of the contest, the contestants will receive a detailed briefing with written and verbal descriptions of the contests.
5. Contestants must wear the nametag furnished by the State Office with only the contestant number showing during the competition. These numbers are assigned by the State Director and only by that person. Do not alter them in any way --remove all other nametags from your clothing.
6. For those in the Skill Contests, if you are given a contestant number for your back make sure the contestant number on your name tag agrees with the one pinned on your back.
7. Student contestants are to be identified during the contest by number only. Contestants' clothing and/or equipment must not have any nametags, patches or other identifying markings which will identify the contestant's name or school they represent. This includes: jackets, shirts, hats, and toolboxes.
8. Contestants may be asked to draw for workstation positions.
9. After a contest begins, contestants are not allowed to communicate with their fellow contestants, instructors, or any observers that may be present.
10. After the contest has begun, judges are not allowed to provide any technical assistance or information to the contestant. Explanations of rules or directions of a non-technical nature are allowed, provided they are made to all contestants.
11. The contest will end at the time announced. No additional time is allowed under any circumstances.

12. Contestants temporarily leaving the contest area while the contest is in progress must be accompanied by one of the contest officials. The time away from contest area cannot be made up. Any contestant leaving the contest area without permission from a contest official may be disqualified.

13. In contrast to National Skills USA Guidelines, no official Skills USA clothing penalties will be imposed in State Skills USA contests.

14. When the contest has concluded, under no circumstance should a contestant, advisor, or instructor seek to discuss the contest with a judge.

## CONTEST REGULATIONS VIOLATION LEVELS

The primary function of these regulations is to insure a fair and equitable contest to all participants. Contestants and advisors must remember when making judgments as to what is an acceptable thing to do, they must consider whether others would agree that it would not affect the outcome or fairness of the contest. Your best defense to protect yourself and the contest is to look at what you are doing from another's viewpoint.

If a violation occurs and a protest is filed with the State Director, the violation must first be verified, before action is taken. If the violation cannot be verified and is rebutted, the protest is null. Upon verification, the State Director will assess the level of violation using the following:

### Level 1--Warning

1. Having identifying articles of clothing, name tags, badges, etc. at contest site.
2. Single minor safety violations.
3. Single minor attitude or behavior problems.
4. Inappropriate clothing.

### Level 2-- Percentage of point reduction

1. Rule violations by an advisor which did not affect a contestant or contest.
2. Multiple minor safety violations.
3. Multiple minor attitude or behavior problems.

### Level 3-- Disqualification

1. Contestant involved in blatant rule violation.
2. Multiple gross safety violations.
3. Gross attitude or behavior problems.
4. Late arrival of contestant to contest or after alternate(s) has been selected.
5. Failure to take the Skills USA—VICA Professional Test.
6. Involvement by an advisor that could change the outcomes of the contest.

In the event a violation occurs and can't be assessed using the above information, the State Director will assemble the Violations Committee. The Violations Committee will consist of the T&I Program Supervisor, the State Director, a minimum of one Washington Skills USA Board of Directors member, and the State President. If a member of the Violations Committee is not available, a Skills USA Regional Coordinator or local Vocational Director from a non-involved school may be substituted. The Violations Committee will be alerted prior to contest time and tallying of points. These regulations are in addition to all other national and state regulations.

# Skills USA

## Machining Contests

### Study Guide

- **General shop knowledge:**
  - Machinery's Handbook
  - Shop safety
  - SAE labeling system
  - Materials identification
  - Cutting speed calculations
  - Conversions (inch/metric and angle/ decimal degrees)
  - Included angles of thread forms
  - Standard machine tapers
- **Vertical Knee Mill:**
  - Milling
  - Drilling
  - Counter boring
  - Tapping
  - Facing
  - Reaming
  - Feedrate formulas
  - Squaring a vise
  - Climb and conventional milling
- **Engine Lathe:**
  - Feedrates
  - Turning
  - Facing
  - Single point threading
  - Drilling
  - Boring
  - Tapping
  - Turning tapers
  - Knurling
  - Chucks
  - Follower rest
  - Steady rest
  - Face plate
  - Lathe dog
  - Centers
  - Turning between centers
- **Other Shop Equipment and Tools:**
  - Drill press
  - Drill bits
  - Band saw blades
  - Tapping
  - Tap geometry
  - Tap identification
  - Pedestal Grinder
  - Grinding wheels
  - Indexing & dividing heads

- **Inspection/Blueprint Reading:**
  - Blueprints interpretation
  - Geometric dimensioning and Tolerance
  - Vernier scale
  - Outside micrometer
  - Inside micrometer
  - Depth micrometer
  - Calipers
  - Height gage
  - Telescope gage
  - Small hole gage
  - Gage blocks
  - Surface finishes
  - Threads over wires
- **CNC:**
  - Turning and Milling G & M codes
  - Geometry offsets
  - Use of cutter compensation
  - Tool holder identification
  - Carbide insert identification