



TECHNOLOGICAL SKILLS CHALLENGES

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YOUR INTERESTS.

DISCOVER
YOUR FUTURE.

CREATE
YOUR CAREER.

DSBN Regional **Precision Machining** Skills Competition 2024 Secondary Level Scope

Chairs: Mr. Grant TenDen

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Purpose of the contest: To assess the contestant's precision machining skills and trade knowledge through practical and theoretical testing.

Date: Tuesday, February 27, 2024 &
Thursday, February 29, 2024

Time: 8:00 am to 4:00 pm

Location: Niagara College, Welland Campus, Rankin
Centre for Advanced Manufacturing

Room: TC114

Skills and knowledge to be tested:

The contest will be held over one day and will include, safety, print reading, machine set-up, and practical machining. The competitors will be broken into two groups and complete two parts: one on each of the engine lathe and the ram & turret mill over the course of the competition days.

Each competitor will use a standard engine lathe and a ram and turret-style mill to machine their parts over the course of the competition days. Each day will consist of 6 hours of machining to produce two parts. (Material 1018 CRS, T6-6061 Aluminum or Brass)

All competitors are to have access to part drawings before the competition to practice.

Note: All measuring will be imperial units.

Engine lathe component:

- External cylindrical/parallel turning
- External taper turning
- External and internal threading with taps and dies
- External grooving
- Internal turning
- Internal angled turning
- Internal radii turning
- Assembly of parts
- Applied Metrology
- Reading blueprints/technical drawings

Note: All turning processes are to be performed with the workpiece held securely in a lathe chuck. Turning between centres is not permitted.

Milling machine component:

- Squaring a block on the mill
- Milling angular faces
- Milling slots
- Drilling holes in precision locations
- Partial internal radius milling
- Counterboring
- Tapping
- Assembly of parts
- Applied metrology
- Reading blueprints/technical drawings

Note: Offhand cutter grinding is allowed.

Safety requirements: Competitors must follow all industry safety standards during the competition:

Safety is a priority at the DSBN Technological Skills Competition. At the discretion of the judges and technical Chair, any competitor can be removed from the competition site for not having the proper safety equipment and/or not acting safely.

- **It is mandatory for all competitors and teacher advisors to wear CSA-approved eyewear and footwear at all times. (including side shields for prescription eyewear)**
- Clothing deemed suitable for machining (no loose straps, baggy sleeves etc.) shall be worn for the competition.
- Jewelry such as rings, necklaces, body pierced jewelry, etc. deemed unsafe by competition judges, or committee members, or by the host college will be removed and stored by the competitor for the duration of the competition.
- To ensure fairness to all competitors, all tools and aids will be removed and stored by the competitor for the duration of the competition.
- Digital slide calipers will be permitted.
- The Vertical Mills will be indicated square by the host college before the start of the competition.
- The practical test will be administrated and marked in imperial (inch) units.

Equipment, materials, tools, and supplies:

Mandatory (competitor supplied):

- CSA-approved eyewear
- CSA-approved footwear

Optional competitor-supplied tools:

- 0-1" Micrometer
- 1-2" Micrometer
- 6" slide calipers
- Dial indicators

Niagara College's machine shop tool crib will have tools available.

Project Material:

Turning competition project- Aluminum or Hot/Cold rolled steel and brass

Milling competition project- Aluminum or Hot/Cold rolled steel and brass

To ensure fairness for all competitors, tools other than those listed above will be taken away until the competition is completed. Sharing of tools or cutters will be allowed.

Important: Competitors will be allowed to bring their own cutting tools.

Project and competition expectations: Competitors will comply with safety standards that apply to a machine shop setting. Competitors will complete the project with relationships to the drawing supplied.

All competitors are to have access to part drawings before the competition to practice.

Judging criteria: Each project will be evaluated by Niagara College. In the event of a tie, the student with the most accurate tolerances will take precedence.

Milling & Turning:

Compliance with occupational health and safety regulations	5
Compliance with dimensions and tolerances specified	40
Compliance with deburring and surface finish	5

Total 50

Clothing requirements: Business casual attire must be worn with DSBN Technology shirts.

Entry: Students must register online at <https://technological-skills-challenges.dsbm.org/> with all of the required information completed to be eligible to participate. Teachers should also forward a list of competitors participating from their school to the contest Chair, Grant TenDen, 7 days before the date of the contest.

Transportation: Students are responsible for their transportation.

Teacher role: Instructors are expected to acquaint their student participants with the enclosed guidelines. Teachers supervising should accompany their students and can visit any time during the competition but may not assist competitors during the challenge. Niagara College staff cannot be responsible for supervising DSBN students.

**** Competitors must be on time for their contest and may be disqualified if they do not sign in at their contest site before the start of orientation. At the discretion of the technical committee chair, the competitor may be permitted to compete but**

would not receive any additional time. Each competitor will be given a number by their coordinator upon registration at the location and will be judged anonymously during the competition.

Competition agenda:

8:00-8:30 a.m.	Sign in/ Arrival/ Set up
8:30 a.m	Orientation
9:00 a.m	Competition begins
12:30 p.m	*****Lunch*****
1:00	Competition resumes
3:00	Competition ends
	Judging
3:30-4:00	Clean up