Skills Compétences Canada

CONTEST DESCRIPTION

# CNC Machining

POST-SECONDARY

SkillsCompétences Canada
Toronto2026

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# 1 THE SKILLS FOR SUCCESS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY

The Government of Canada has updated the previous Essential Skills framework to the new Skills for Success model in response to the evolving labour market and changing skill requirements. This model outlines nine fundamental skills Canadians need to thrive in work, education, training, and daily life.

Skills/Compétences Canada aims to highlight the importance of these skills, vital for success in trade and technology careers. Competitors can see how Skills for Success are integrated into contest descriptions, projects, and project documents. Recognizing these skills during the competition helps competitors match tasks with specific skills necessary for success and understand how these skills apply within their trade or technology programs and future careers.

The nine key Skills for Success, validated for workplace success, are:

1. Numeracy
2. Communication
3. Collaboration
4. Adaptability
5. Reading
6. Writing
7. Problem Solving
8. Creativity and Innovation
9. Digital

These Skills for Success are detailed in sections 2.4 and/or 3.2 (to be completed by SCC) of your Contest Description and, if relevant, in your Project and supporting documents.

# 2 CONTEST INTRODUCTION

**2.1** Description of the associated work role(s) or occupation(s)

https://www.skillscompetencescanada.com/en/skill_area/cnc-machining/

**2.2** Purpose of the Challenge

Assess the contestant's CNC machining operational skills and techniques utilizing CNC equipment and CAD/CAM software.

**2.3** Duration of contest

2 days – 3 to 4 hours per day.

**2.4** Skills and Knowledge to be tested.

The contest involves manufacturing a precision component using a CNC turning centre and a CNC Vertical Milling centre.

- Reading and Interpreting engineering drawings[5]
- Proficient use of Mastercam to program CNC machines.[9]
- (Turning Centre) May include external and internal turning, taper turning, threading, drilling, boring, face grooving and applied metrology.[1]
- (Machining Centre) May include pocketing, profiling, drilling, reaming, tapping, chamfering, thread milling and applied metrology.[1]

*Skills for Success - [1]Numeracy, [5]Reading, [9]Digital*

## 3 CONTEST DESCRIPTION

**3.1** List of documents produced and timeline for when competitors have access to the documents on the Skills/Compétences Canada website.

| DOCUMENT | DATE OF DISTRIBUTION |
|---|---|
| 2025 Project Isometric Views for Reference | December 2025 |
| Generic Cutting Tool List | December 2025 |

**3.2** Tasks that may be performed during the contest.

- Interpret engineering drawings and follow the specifications ISO A (American) drawing representation[5]
- Creation, manipulation, and recreation of possible supplied CAD or 3D model[7]
- Project could consist of assembly parts that may include components made from both the lathe and mill.
- Identify and designate the different machining processes on a CNC machine
- Select and apply appropriate cutting technology according to the cutting parameters, the material, equipment and cutting tools[7]
- Utilize MasterCam[9]
- Generate G-Code
- Setup and operate CNC Equipment
- Select appropriate measuring tools or gauging instruments and use them correctly.[7]
- Make accurate measurements using precision measuring tools.[1]
- Inspect and maintain the accuracy of dimensions within the tolerances.[1]

*Skills for Success* - [1]Numeracy, [5]Reading, [7]Problem Solving, [9]Digital

## 4 EQUIPMENT, MATERIAL, CLOTHING

**4.1** Equipment and material provided by Skills/Compétences Canada

- CNC Machining Centre (Haas VF-2 or similar) – http://www.hasscnc.com/
- CNC Turning Centre (Haas ST-20 or similar)
- CAD/CAM system (within one year of current version of Mastercam) – If a competitor requires Mastercam access for training, contact In-House Solutions. Phone: 1-800-529-5517

- Cutting tools and holders
- All raw material (one part per competitor)
- Parallels/soft blow hammers/wrenches/vices/deburring files
- Computers and Mastercam software
- Digital micrometers 0-100mm
- Digital caliper 0-200 mm
- Depth micrometer (digital) 0-100 mm
- Thread micrometer (digital) 25-50 mm
- Dial test indicator
- Plunge style indicator and base
- Edge finder
- Telescoping gauges
- Thread gage (metric)

**COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIAL AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.**

**4.2** Equipment and material provided by the competitor.

- Nonprogrammable calculator/machinist calculator
- Machinery's Handbook/Machine manual (optional)
  - Haas Mill Operators Manual
  - Haas Lathe Operators Manual
- No other cutting or non-cutting tools allowed
- No personal computers or other CAD/CAM software allowed

**4.2.1** Pen, highlighters, etc. (optional)Toolboxes Guidelines

All required tools are supplied by Skills Canada.

**4.3** Required clothing provided by the competitor.

- Long pants (no shorts allowed)
- No shirts with sleeves past the elbows
- No loose clothing
- Entanglement hazards to be removed
- Shop coat with rolled up sleeves (optional)

## 5 HEALTH AND SAFETY

**5.1** Safety program

SCC has implemented a comprehensive safety program as health and safety is an integral part of our competitions. Our safety program includes guidelines and procedures to make the work environment in each skill area safer.

**5.1.1** Safety manual

As part of our program a safety manual has been created to monitor and document health and safety within each skill area. It includes a definite plan of action designed to prevent accidents. The safety manual will be provided for every skill and these instructions must be followed and respected by all participants and officials at the SCNC.

**5.1.2** Safety workshop

During orientation, Competitors will participate in a Safety workshop, and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety, and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

**5.2** List of required personal protective equipment (PPE) provided by Skills/Compétences Canada

- N/A

**5.3** List of required personal protective equipment (PPE) provided by the competitor.

- CSA-approved safety boots
- CSA-approved safety glasses
- Hearing protection (optional, earmuff style protectors and wireless headsets are prohibited)

**Note**: Competitors who do not have the required protective equipment will not be allowed to participate in the competition.

## 6 ASSESSMENT

**6.1** Point breakdown

**Note:** This list is subject to change.

| TASKS | /100 |
|---|---|
| Compliance with occupational health and safety regulations | 5 |
| Compliance with dimensions, tolerances, and surface finish specified in plans for Milling | 45.5 |
| Compliance with dimensions, tolerances, and surface finish specified in the plans for Turning | 45.5 |
| No additional part (material) per competitor. One piece per person | 0 |
| If a failure of a tool occurs as a result of a competitor's negligence, a loss of – 2 per tool will be deducted. | (2) |
| Practical set-up procedure for Turning Centre | 2 |
| Practical set-up procedure for Milling Centre | 2 |

## 7 CONTEST SPECIFIC RULES

Contest specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from contest to contest. Any additional contest rules will be reviewed during the competitor orientation.

| TOPIC/TASK | CONTEST SPECIFIC RULE |
|---|---|
| Use of technology – digital memory devices | • Competitors are not allowed to bring digital memory devices into the workshop. |
| Use of technology – personal devices | • Competitors are not allowed to bring personal laptops, tablets or cellphones into the workshop. |
| Drawings - recording information | • Competitors are not permitted to take drawings or recorded information out of the workshop.<br>• Coaches, trainers, and competitor team members are prohibited from photographing projects and drawings during competition. Violation will result in the disqualification of the associated competitor at the discretion of the NTC. |
| Tools/infrastructure | • Competitors are not allowed to bring their own tools and measuring instruments.<br>• Competitors are not allowed to change the machine or computer parameters/settings.<br>• Competitors are not allowed to tamper with or bypass safety interlocks.<br>• No other software other than Mastercam permitted.<br>• No substantial manual programing permitted (see additional information) Program editing at the machine is allowed. No use of conversational (VPS) allowed. |
| Equipment failure | • If equipment or tools supplied by Skills/Compétences Canada fail, extra time will be allowed only if the NTC member, sponsor technician, or equipment supplier determines it is not caused by user error. |
| Food/Drink | • Competitors are permitted to have water in a closed container, but food and drink are otherwise prohibited while machining or programming. |
| Trainer | • Trainers and competitors are not permitted to coach, communicate, or remain near the contest area unless authorized. Photography or recording in and around the contest area is subject to NTC approval. |

# 8 ADDITIONAL INFORMATION

## 8.1 Interpreter

If a competitor requires the help of an interpreter once onsite during the competition, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service may not be guaranteed.

## 8.2 Ties

- **Tiebreaker #1:** In the event of a tie, the competitor with the highest score in the Compliance with dimensions, tolerances, and surface finish specified in plans for Milling criteria will be declared the winner.
- **Tiebreaker #2:** If a tie remains, the competitor with the highest score in the Compliance with dimensions, tolerances, and surface finish specified in the plans for Turning will be declared the winner.
- **Tiebreaker #3:** If a third tie occurs, the competitor with the highest score in the Compliance with surface finish criteria will be declared the winner.

## 8.3 Competition rules

Refer to the competition rules of the Skills Canada National Competition which can be found on our website.

# 9 NATIONAL TECHNICAL COMMITTEE MEMBERS

| MEMBER ORGANIZATION | NAME |
|---|---|
| Prince Edward Island | Andrew Townshend |
| New Brunswick | Bob Doucet – Chair |
| Quebec | Éric Bilodeau |
| Ontario | Joe Scheerer – Co-Chair |
| Manitoba | Arthur Gusowski |
| Saskatchewan | Jonathan Crane |
| Alberta | Brandon Walker |
| British Columbia | Marte Arreola |
| Nova Scotia | Patrick Snider |

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Nathalie Maisonneuve (nathaliem@skillscanada.com).