



CONTEST DESCRIPTION

# Mobile Robotics

SECONDARY

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

In response to the evolving labour market and changing skill needs, the Government of Canada has launched the new Skills for Success (former Essential Skills) model defining nine key skills needed by Canadians to participate in work, in education and training, and in modern society more broadly. SCC is currently working with Employment and Social Development Canada (ESDC) to bring awareness of the importance of these skills that are absolutely crucial for success in Trade and Technology careers. Part of this ongoing initiative requires the integration and identification of the Skills for Success in contest descriptions, projects, and project documents. The next phase and very important aspect of our Skills for Success (SfS) initiative is to provide a Skills Report Card to each competitor at the Skills Canada National Competition. The purpose of the report card is to inform the competitor about their current level of nine identified Skills for Success based on their competition scores. With this knowledge, the competitor will be made aware which skill may require improvement. Full implementation is expected in the next Skills Canada National Competition.

The following 9 skills have been identified and validated as key skills for success for the workplace in the legend below:

<sup>1</sup>Numeracy, <sup>2</sup>Communication, <sup>3</sup>Collaboration, <sup>4</sup>Adaptability, <sup>5</sup>Reading, <sup>6</sup>Writing, <sup>7</sup>Problem Solving, <sup>8</sup>Creativity and Innovation, <sup>9</sup>Digital

These Skills for Success have been identified in section 2.4 and/or 3.2 of your Contest Description and if applicable, 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/mobile-robotics/](https://www.skillscompetencescanada.com/en/skill_area/mobile-robotics/)

### 2.2 Purpose of the Challenge

To create engineering projects to encourage individuals with different skill sets to form co-operative teams<sup>2,3</sup> to design, fabricate, and operate a robot or multiple robots<sup>4,7,8</sup>.

### 2.3 Duration of Contest

12 hours. A detailed schedule will be posted on our website prior to the event.

### 2.4 Skills and Knowledge to be tested.

The intent of the challenge is to have teams of students<sup>2,3</sup> independently designing / fabricating / operating robots<sup>4,7,8</sup> capable of completing the competition tasks in competition with other student-fabricated robots. Teams are not allowed to develop or implement strategies based on interfering with their opponent's ability to complete the competition task set.

*Skills for Success: <sup>2</sup>Communication, <sup>3</sup>Collaboration, <sup>4</sup>Adaptability, <sup>7</sup>Problem Solving, <sup>8</sup>Creativity and Innovation*

### 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
Contest Description	September 2023
Project	September 2023
Court Specifications	November 2023
Autonomous Project	Morning of Competition Day 1
Component Collection	Delivered to Member Organization by March 15, 2024
Competition Questions Deadline	March 31 <sup>st</sup> , 2024

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

A team will consist of two competitors<sup>2,3</sup>.

Teams will participate in BOTH the Teleoperation and the Autonomous Competition Elements on BOTH Competition Days

*Skills for Success: <sup>2</sup>Communication, <sup>3</sup>Collaboration*

### 4 EQUIPMENT, MATERIAL, CLOTHING

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

- Autonomous Kits (SCC will provide to the Member Organizations by March 15, 2024). Member Organizations will be responsible to distribute these kits to their competitors.
- Exclusive Use Playing Fields for each Team's Game and Evaluated Robot Experiences
- One worktable with access to a 120 V Power outlet (minimum 100W) per team. Component's Collection providing mechanical/electrical/control hardware required for the "Built On-Site Autonomous Robot Competition Element"

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

- Robots and Robot accessories (including batteries, battery charger, spare parts)
- Various tools required to modify and repair robots on site.
- 25-foot multi-outlet extension cord/power bar
- Wiring diagram
- Safety Data Sheet for Batteries
- Easily accessible fuses
- Easily accessible kill switch(es)

- Laptop(s)
- Toolboxes Guidelines:
  - One of the objectives of SCC is the sustainability of the Competition. As a result, the toolboxes brought by Competitors will be restricted to the following maximum specifications.
  - The Competitor toolbox must not exceed (64ft<sup>3</sup>) 1.81 meters<sup>3</sup> in volume. It can be multiple toolboxes, but the total of all toolboxes must not exceed the maximum volume indicated. There is no exception to this rule.
  - If the Competitor toolbox is larger than what is indicated, the Competitor with the guidance of the NTC, will need to remove items from the toolbox and those items will not be used during the competition. All tools must fit inside one or more toolboxes. Tools outside of a toolbox will not be permitted.

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

- Closed toe shoes

## 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 competitors.

- Safety Glasses
- Ear plugs (if required by ESR)

- Closed toe shoes

**Note:** Contestants who do not have the required protective gear will not be allowed to participate in the contest.

## 6 ASSESSMENT

### 6.1 Point breakdown

Medals will be determined by the overall results of the two days of competition.

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

TASKS	/100
Autonomous Task	39
Teleoperated Task	59
Safety Mark	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
Teleoperated Task	<ul style="list-style-type: none"> <li>• Competitors will compete in the Teleoperated task during the 2 days of competition. This is described in detail in the project document.</li> </ul>
Autonomous Task	<ul style="list-style-type: none"> <li>• Competitors will compete in the Autonomous task during the 2 days of competition. The details of this task will be released at the beginning of the competition.</li> <li>• This task will make use of the provided Autonomous Competition Kit</li> </ul>
Safety Mark	<ul style="list-style-type: none"> <li>• Safe operation and safe workspace practices</li> </ul>

## 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

Ties in individual games are allowed. No ties in overall mark total are allowed. If a tie in overall marks occurs, the tie will be broken by examining the following individual mark categories in this order:

- Tiebreaker #1: Comparison of the tied team overall points scored totals in all tournament games each team played. If the teams remain tied, then:
- Tiebreaker #2: Comparison of each team total marks awarded in the “Autonomous Robot Section.”
- Tiebreaker #3: Comparison of the tied team total marks awarded based on their 20 tournament play individual games (total # of individual game losses = 0 marks / total # of individual game ties = 1 mark / total # of individual game wins = 2 marks).

## 8.3 Test Project change at the Competition

Where the Test Project has been circulated to Competitors in advance, NTC may change a maximum of 30% of the work content. Please refer to the Competition Rules.

## 8.4 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
Newfoundland and Labrador	Dave Keefe
Alberta	Mark Shaw – Chair
New Brunswick	Edison Wasson
Ontario	Dan Kurz
Manitoba	Ken Hartikainen
Saskatchewan	Dave Dalton – Co-Chair
British Columbia	Steve Claassen
Northwest Territory	Kevin Chiasson
Yukon	Tyler Bradford
Nova Scotia	Kyle Denney
Prince Edward Island	Jonathan Hayes

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