2025
27th ANNUAL SKILLS MANITOBA COMPETITION
CONTEST DESCRIPTION

CONTEST NAME: Electronics

CONTEST NO: 16

CATEGORY: Post-Secondary – Maximum 6 competitors

CONTEST LOCATION: Manitoba Institute of Trades and Technology – 7 Fultz – Fabrication lab

CONTEST START TIME AND DURATION:
8:30 am start time – approximately 1:30 pm

PURPOSE OF CHALLENGE:
To evaluate each competitors' skills and to recognize outstanding students for excellence and professionalism in the field of Electronics Technology

SKILLS AND KNOWLEDGE TO BE TESTED:
The contest will cover the theoretical and practical aspects of current state of the art electronic industry standards. The competitor **may** be asked to demonstrate abilities in the following areas:

- Interpret electronic schematic diagrams, wiring diagrams, and technical specifications.

- Identify and test common electrical and electronic components.

- Construct, analyze and troubleshoot DC circuits including series resistance, parallel resistance, series-parallel resistance and switching circuits.

- Construct, analyze and troubleshoot AC circuits including capacitive, inductive and complex RLC circuits.

- Construct, analyze and troubleshoot analog circuits including discrete amplifiers, operational amplifiers and comparator circuits.

- Construct, analyze and troubleshoot basic digital circuits including TTL/CMOS gates, timers, counters, encoders/decoders and 7-segment displays.

- Hand solder through-hole or surface mount components on a printed circuit board to acceptable industry standards.

- Hand de-solder components on a printed circuit board to acceptable industry standards.

- Circuit fault finding

- Demonstrate use of common electronic measuring equipment including multimeters, power supplies, frequency generators and oscilloscopes

- Interface to a microcontroller.

- Use of electronic design and simulation software.

POINT BREAKDOWN / 100 TOTAL:

Item	Point Value/Percentage
PCB Design and Layout	25
Assembly and Testing	25
Embedded System Programming	50

NATIONAL COMPETITION ELIGIBILITY:
- A mark of **70% or higher** must be scored by the gold medalist in each contest for them to attend the National Skills Competition

EQUIPMENT, TOOLS, MATERIALS TO BE PROVIDED BY COMMITTEE:
All equipment/materials required for contest, but not supplied by competitor.

EQUIPMENT, TOOLS, MATERIALS TO BE SUPPLIED BY COMPETITOR:
Hand Tools:

- 25 watt Solder Iron, Stand, Tip Cleaner, tips of choice. **Butane solder devices will not be allowed.**
- Hand vacuum extractor or Solder Wick
- Flux, liquid or paste
- Long nose pliers
- Side Cutters
- Wire Stripper
- Three set of test leads (banana jack with alligator clips)
- Utility knife (exacto-knife)
- Screwdrivers; Slot, Philips

- "Third Hand" including magnifying glass
- Power bar, 4 or more outlet
- Pens, pencils, eraser, ruler
- Safety Glasses/Goggles
- 2 breadboards, minimum size each 2" x 6" (wire will be supplied)
- Desk Lamp
- No programmable calculator
- Laptop computer loaded with Arduino and KiCAD software. Competitors will use an Arduino microcontroller and KiCAD.
- Hearing protection to block out some of the noise from other contests

   Students will be provided with instruction on any test equipment being used.

   Technical Committee will inspect other tools for suitability.

WORKSITE SAFETY RULES / REQUIREMENTS:
Competitors are to be dressed in a clean and safe manner (no jewelry on hands or wrists).

Safety glasses must be worn for the soldering/desoldering project. Failure to comply with Tech Committee Members may result in disqualification from the competition at the discretion of the Committee.

SPECIAL CONDITIONS / ADDITIONAL INFORMATION:
In the event of a tie, the winner will be determined by the highest mark in the embedded systems project.

If a tie still exists then the winner will be determined by the highest mark in the assembly and testing project.

If a tie still exists then the winner will be determined by the highest mark in the PCB Design and Layout project.

THE IMPORTANCE OF ESSENTIAL SKILLS 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 following 9 skills have been identified and validated as key skills for success for the workplace: 1.Numeracy, 2.Communication, 3.Collaboration, 4.Adaptability, 5.Reading, 6.Writing, 7.Problem Solving, 8.Creativity and Innovation, 9.Digital

TECHNICAL COMMITTEE MEMBERS CONTACT INFORMATION:
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