#16 Electronics - Post-Secondary
Competition Scope

CONTEST NAME: Electronics (Post-Secondary)

CONTEST NO: 16

CATEGORY: Post-Secondary– Maximum 4 competitors

CONTEST LOCATION: Tradex, Abbotsford

CONTEST START/FINISH TIME:

Contestants arrive:	8:00am
Contest start:	8:30am
Lunch:	12:00pm - 12:30pm
Contest finish:	3:00pm

The 30 minute lunch break will be strictly enforced. Competitors must leave the competition area for the time allotted.

PURPOSE OF CHALLENGE:

To evaluate each competitor's 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 theoretical and practical aspects of current 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 and switching circuits.
- Construct, analyze and troubleshoot AC circuits including capacitive, inductive and RLC circuits.
- Construct, analyze and troubleshoot analog circuits including comparator and operational amplifier circuits.
- Construct, analyze and troubleshoot digital circuits including logic gates, timers, encoders/decoders, counters and 7-segment displays.
- Hand solder through-hole and SMD components on a printed circuit board to acceptable industry standards.
- Hand de-solder components on a printed circuit board to acceptable industry standards.
- Reverse engineer an electronic circuit, including converting a PCB layout to a circuit diagram (schematic).
- Troubleshoot simple electronic circuits having a preinstalled fault.
- Demonstrate use of common electronic testing/measuring equipment including multimeters, power supplies, frequency generators and oscilloscopes.
- Interface to a microcontroller (Arduino).
- Use of electronic design and simulation software. (Eg. KiCad/Eagle)

POINT BREAKDOWN / 100 TOTAL:

Breadboard/microcontroller challenge:	40%
SMD Soldering challenge:	40%
Circuit design/analysis challenge:	20%

NATIONAL COMPETITION ELIGIBILITY:

A mark of **70% or higher** must be scored by the gold medalist in each contest in order for them to attend the National Skills Competition.

EQUIPMENT, TOOLS, MATERIALS TO BE PROVIDED BY COMMITTEE:

All equipment, materials and components required for the contest will be provided by the technical committee. This includes:

- Soldering station, stand, tip cleaner
- Hand desoldering tool, solder wick
- Hand tools - long nose pliers, side cutters, wire strippers
- Third hand, inc. magnifying glass
- Multimeter
- Power supply
- Oscilloscope
- Frequency generator
- Arduino microcontroller with USB-A lead to connect to competitor's laptop

Additional equipment may be provided if required for the contest.

EQUIPMENT, TOOLS, MATERIALS TO BE SUPPLIED BY COMPETITOR:

Any of the tools and equipment listed above and provided by the technical committee may be replaced by the competitor, however they will be inspected for suitability. Any items deemed to offer an unfair advantage will not be allowed, and the provided equipment must be used.

Laptop with the following pre-installed:

- Arduino IDE
- Circuit design software (Eg. KiCad, Eagle or similar)

Additional items:

- Pens, pencils, eraser, ruler
- Safety Glasses/Goggles
- Desk Lamp (optional)
- Non-programmable calculator
- Hearing protection (optional)
- Headphones (optional)

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 may result in disqualification from the competition at the discretion of the technical committee.

SPECIAL CONDITIONS / ADDITIONAL INFORMATION:

- In the event of a tie, the winner will be determined by the highest mark in the breadboarding/microcontroller project.
- If a tie still exists then the winner will be determined by the highest mark in the SMD soldering and desoldering projects.
- If a tie still exists then the winner will be determined by the highest mark in the circuit design/analysis project.

TECHNICAL COMMITTEE CHAIR CONTACT INFORMATION:

Adam Drake 236-986-6422 drake_a@surreyschools.ca