Contest Description
Mechanical Engineering CAD
Post-Secondary

DATE April 5 2024	LOCATION NSCC Ivany Campus
TIME	**TASK**
8:00am - 9:00am	Orientation
9:00am – 12:00pm	Competition Task 1 (3 hours)
12:00pm – 1:00pm	Lunch
1:00pm – 4:00 pm	Competition Task 2 (3 hours)
4:00 pm	Competition concludes & judging will begin.

1. Purpose of the Contest

The purpose of the contest is to evaluate each contestant's preparation for employment in the field of Engineering Design and Drafting using CAD and to recognize outstanding students for excellence & professionalism in their field.

2. Criteria

Tasks that may be performed during the contest.

- Sketching, analyzing measurements and part measuring.
- Implement design changes by using problem solving, decision making and critical thinking skills.
- Detail drawing from assembly and blueprint document interpretation.
- Assembly from details.
- Parametric Modeling – Family of parts and/or assemblies.
- Export a variety of 3D model formats such as STL files with proper units and resolution for additive manufacturing, STEP files, Cura .3mf files, 3D PDF
- Rapid prototyping using 3D Printing.
- Exporting drawings as multi-page 2D files.
- Import a variety of 3D model formats such as STP (STEP) files.

3. Number of Stations

There are four (4) stations available

4. Skills & Knowledge to be Tested.

Competitors will be required to demonstrate their ability to:

- Prior to the competition, the competitor shall create metric A3 and inch B size templates with title block containing the information shown in the example that will be provided after competition registration.
- Use CAD software to produce drawings that comply with the ASME Y 14.5M-2018 Standard.
- Use CAD software to produce 3D parametric models of parts and assemblies from physical measurement, drawing files (PDF) and/or model files.
- Use measuring instruments.
- Dimension and tolerance drawings to industry standards, including Geometric Dimensioning and Tolerancing (GD&T).
- Design components for rapid prototype product development (3D printing) using Fused Filament Fabrication (FFF)
- Utilize rapid prototyping (3D printing) to produce a functional prototype using Fused Filament Fabrication (FFF)
- Generate input files for 3D printing (G-Code) using the latest version of CURA 3D printing software as of the date of the competition orientation https://ultimaker.com/en/products/ultimaker-cura-software
- Develop new product designs which will function properly within an assembly or on their own.

5. Prerequisites

Contest Specific Prerequisites

- Have ability to interpret and prepare drawings according to ASME standards.
- Have knowledge of materials and manufacturing processes.
- Have proficiency with basic dimensioning.
- Proficiency with geometric dimensioning and tolerancing.
- Proficiency with CAD software.

SCNS Prerequisites

- Post-Secondary competitors must meet the following criteria in the current school year:
- Be enrolled in a community college, university, private school OR be a registered apprentice with the Department of Labour and Advanced Education (Apprenticeship Agency);
- Be registered as a competitor with Skills Canada – Nova Scotia;
- The competitor cannot be a certified journey-person;
- Possess Canadian citizenship or Permanent Resident (Landed Immigrant) status and be a resident of Nova Scotia; or be a registered International Student. Competitors are responsible for verifying this information if requested;
- Have been earning post-secondary credits in a sector relevant to the one in which they wish to compete (i.e. to compete in carpentry, the student would be earning credits in any construction-related trade) at any time during the academic school year (September to June);
- All competitors must be able to show either current apprenticeship status and/or proof of enrollment in a post-secondary institution upon request of the Provincial Technical Committee (PTC) or Skills Canada – Nova Scotia.
- Have completed and submitted a signed release form

6. Equipment & Clothing

1.1.1. Equipment and material provided by Skills Canada – Nova Scotia

- Each competitor is restricted to a tabletop workspace of approximately 36" x 30".
- A computer with a CPU of 2.5 GHz, 16 GB of RAM, DirectX 11 compliant GPU w/ 1 GB of VRAM, running Windows 10 will be the minimum caliber of competition workstation. All workstations will be equipped with a mouse, keyboard, 3D Mouse, USB port, headphone Jack and dual 24" monitors.
- Autodesk Inventor© Professional 2023 will be the official CADD program used in the contest.
- CADD workstations will be identical for all competitors.

a) What Competitors Must Supply

- 6" measuring caliper. (slide, dial, digital)
- Paper, pens, and pencils.
- Competitors may bring, textbooks, reference books, course handouts, course notes, software reference manuals, reference tables, and calculators.
  (All reference materials are subject to inspection and approval by the judges and cannot be shared between competitors.)
- Appropriate attire suitable for a Provincial championship is required.

7. Evaluation & Judging Criteria

Contest Projects consist of work that will be marked according to the following:

POINT BREAKDOWN	**/ 100**
Measure, 3D model and prepare a detail drawing of a sample part.	35
Create the iParts, and iAssembly for the mechanism.	20
Create an Exploded Assembly drawing of the mechanism.	15
Create a Family drawing of the mechanism.	15
Create a mechanical animation of the mechanism.	15
TOTAL	_____ **/ 100**

No ties are permitted.

Please note: a detailed breakdown of the marking method will be given in:

1. SCNS24-5 Prerequisite Modeling Description.pdf
2. SCNS24-5 Parametric Modelling Project Description.pdf
3. SCNS24-5 Part Measurement Project Description.pdf

8. PTC Contact Information

Name	Employer	Email
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