Purpose
To evaluate each contestant’s preparation for employment and to recognize outstanding students for excellence and professionalism in the field of technical drafting.

Eligibility
Open to active SkillsUSA members enrolled in programs with technical drafting as the occupational objective.

Clothing Requirements
NYS Business Casual - which consists of:
- Button-up collared, white dress shirt, white blouse (collarless or small-collared) or white turtleneck, with any collar.
- Black dress slacks (accompanied by black dress socks or black or skin-tone seamless hose) or black dress skirt (knee-length, accompanied by black or skin-tone seamless hose)
- Black dress shoes - no open back or open toed shoes

Note: Contestants must wear their official contest clothing to the contest orientation meeting. Also #2 pencil, resume, and safety assurance form.

Equipment and Materials
1. Supplied by the technical committee for each contestant:
   a. Flat table space approximately 24”x72”
   b. Chair
   c. Two 110-volt electric outlets
   d. Flash drive
   e. Printer with toner
   f. Paper
2. Supplied by the contestant (These materials cannot be shared with other contestants.):
   a. A personal computer
   b. Computer-aided drafting software that is able to create 3D models.
   c. Battery-powered calculator (not a cell phone).
   d. Machinery's Handbook and a maximum of three additional published reference books
   e. All competitors must create a one-page résumé and submit a hard copy to the technical committee chair at orientation. Failure to do so will result in a 10-point penalty.

Note: Your resume may be judged as part of your contest” Check the Contest Guidelines and/or the updates page on the NYS SkillsUSA Website: [http://www.nysskillsusa.org](http://www.nysskillsusa.org)

Computer/Software Requirements
Contestants should have installed and/or set when arriving at the contest:

1. Network Configuration
   The following network components must be installed:
   - Client for Microsoft Networking
   - 10/100 10-Base T Ethernet Network Interface Card (wireless not supported)
   - TCP/IP Protocol
   Contestants should not install file and printer sharing for Microsoft networks.

   Contestants should be prepared to connect to a Microsoft Windows 2000 Server domain named “DOMAIN”. This means the computer’s workgroup name should be DOMAIN, and Windows NT, Windows 2000 and Windows XP computers should have a local user named “USER”, and USER should be a member of the LOCAL ADMINISTRATOR group. (Windows Vista is not supported for this contest.)

   All computers (but particularly notebooks) should be prepared to connect to a wired 10BASE-T network. Vista is not allowed.
2. **Printer Driver Information**
   Hewlett Packard Desk Jet 1220 Driver should be installed. This driver is available at: www.hp.com.

3. **Application Software**
   The latest service packs and updates should be applied to application software before the contest. This is the contestant’s responsibility. Ability to correctly plot cannot be guaranteed unless the latest service packs and updates are applied to contestant’s application software.

4. It is advisable for contestants to bring their system software and the software they will be using for the contest in case they have setup trouble.

   There will be technicians on the floor the day of setup to assist contestants if they need help with cables, software, drivers, etc. Contestants renting computers can get help at that time.

**SCOPE OF THE CONTEST**
The contest will focus on the application of appropriate entry-level technical drafting skills to solve visualization and presentation problems of a mechanical nature as designed by the national technical committee.

**Knowledge Performance**
The contest will include a written exam that assesses technical drafting general knowledge (see standards and competencies).

**Skill Performance**
The contestants are assessed on their ability to create 3D models and extract properly scaled 2D views from those models for placement and annotation on standard inch or metric sized drawing sheets.

**Contest Guidelines**
1. The contestants are required to create part and assembly drawings of a mechanical product. The number of drawings will vary depending on the product. The drawing portfolio may vary between five to 10 drawings.
2. Contestant-supplied computer aided drafting and design software is used.
3. The contestants work independently. No assistance may be given by other contestants, instructors, advisors or observers.
4. All contestants start, break for lunch, and finish at the same time. No one is allowed to work during lunch or past the contest conclusion. If contestants are waiting to print after the contest conclusion, they are allowed to print one drawing only.
5. Contestants will store all their drawings in PDF format on supplied flash drives for printing.
6. Contestants’ drawings are judged relative to preestablished criteria for each drawing in the drawing portfolio. The total contest points include points from the written exam and drawings.

**Standards and Competencies**
The following items are included in the written exam and skill performance parts of the contest.

**TD 1.0 — Create 3D computer models of mechanical parts**
1.1 Use sketches, solids and Boolean operations of union, subtraction and intersection to build model geometry
1.2 Use sketches and paths to create lofted and helical features
1.3 Add draft to models
1.4 Add threads, fillets, rounds and chamfers to models
1.5 Use mass properties commands to determine part weight, mass, center-of-gravity, etc.

**TD 2.0 — Build assemblies using 3D computer models**
2.1 Use assembly constraints to position and relate constructed models to each other
2.2 Create an exploded assembly

**TD 3.0 — Demonstrate knowledge of drawing borders and title blocks**
3.1 Recall and create inch and metric sized borders and title blocks
TD 4.0 — Demonstrate knowledge of different drawing types
4.1 Describe and create 2D monodetail, inseparable assembly and final assembly drawings
4.1.1 Add parts lists and item balloons to inseparable assembly and final assembly drawings
4.2 Add symbols and notes associated with castings, forgings and molded parts

TD 5.0 — Demonstrate knowledge of the alphabet of lines and lettering
See ASME Y14.2-2014 Line Conventions and Lettering.
5.1 Recognize the different types of lines used on drawings
5.2 Recall letter heights used on different areas of a drawing

TD 6.0 — Extract 2-D orthographic and pictorial views from 3-D computer models to create 2-D drawings
See the ASME Y14.3-2012 Orthographic and Pictorial Views standard.
6.1 Recognize the differences between first angle, third angle and arrow methods of projection
6.2 Lay out orthographic views using the third angle projection method
6.3 Project true size and shape auxiliary views from inclined surfaces shown in principle orthographic views

TD 7.0 — Demonstrate knowledge of section views
See the ASME Y14.3-2012 Orthographic and Pictorial Views standard.
7.1 Describe and create full, half and broken-out sections

TD 8.0 — Demonstrate knowledge of datum features
See ASME Y14.5-2009 Dimensioning and Tolerancing standard.
8.1 Apply surface and size feature datums
8.2 Apply datum targets

TD 9.0 — Apply general and geometric dimensions and tolerances to 2-D part views.
See the ASME B4.1-R1999 Preferred Limits and Fits for Cylindrical Parts and ASME Y14.5-2009 Dimensioning and Tolerancing standards.
9.1 Recognize and calculate size tolerances for clearance and interference fits
9.2 Recognize and apply limit, bilateral, unilateral, and unequal bilateral tolerances
9.3 Recognize and apply general and geometric dimensioning symbols

TD 10.0 — Demonstrate knowledge of metal material codes
10.1 Recognize and apply material codes as specified by the American Iron and Steel Institute (AISI), the Society of Automotive Engineers (SAE), the American Society for Testing and Materials (ASTM), the American Society of Mechanical Engineers (ASME), and Unified Numbering System (UNS)

TD 11.0 — Demonstrate knowledge of threaded fastener notation
See the ASME Y14.6-2001 Screw Thread Representation standard.
11.1 Recognize and apply inch and metric thread notes

TD 12.0 — Demonstrate knowledge of surface texture notation
See the ASME Y14.36-1996 Surface Texture Symbols standard.
12.1 Recognize and apply roughness averages, cutoff values and lay symbols to surface texture symbols

TD 13.0 — Demonstrate knowledge of weld notation
See the AWS A02.4-2012 Standard Symbols for Welding standard.
13.1 Recognize and apply weld type symbols, weld size and weld process abbreviations to basic weld symbols
TD 14.0 — Demonstrate knowledge of drawing revisions
See the ASME Y14.35 Drawing Revisions standard.
14.1 Create an appropriate revision block
14.2 Apply revision balloons
14.3 Create a document change notice (DCN)
Contest Name **Technical Drafting**

Chairperson: Rob Fragoman

**Only Special Instructions received by Feb. 28, 2020 will be posted on the website!!!**

**Deleted Materials & Supplies:**

Drafting paper/vellum

“for your specific printer Hewlett Packard DeskJet 1220 Driver”

“Ability to correctly plot cannot be guaranteed unless the latest service packs and updates are applied to contestant’s application software.”

**Additional Materials & Supplies:**

2b: Technical software of choice (photocopies of software licensing for every software program used in the contest must be submitted to the technical committee at the pre-contest meeting)

1. Network Configuration The following network components must be installed:
   - Client for Microsoft Networking
   - 10/100 10-Base T Ethernet Network Interface Card (wireless not supported)
   - TCP/IP Protocol

Contestants should not install file and printer sharing for Microsoft networks.

Contestants should be prepared to connect to a Microsoft Windows 2000 Server domain named “DOMAIN”. This means the computer’s workgroup name should be

DOMAIN, and Windows NT, Windows 2000 and Windows XP computers should have a local user named “USER”, and USER should be a member of the LOCAL ADMINISTRATOR group. (Windows Vista is not supported for this contest.)

All computers (but particularly notebooks) should be prepared to connect to a **wired** 10-Base T network. Vista is not allowed.

Other:

**SCOPE OF THE CONTEST: Contest Guidelines**

Removed:

“If contestants are waiting to print after the contest conclusion, they are allowed to print one drawing only.”

“Contestants will store all their drawings in PDF format on supplied flash drives for printing.”