LEVEL UP 2026 - 2027

NYS SkillsUSA

TECHNICAL DRAFTING

PURPOSE

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

ELIGIBILITY

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

CLOTHING REQUIREMENTS

NYS SkillsUSA Business Professional

- White polo shirt (plain or with SkillsUSA or SkillsUSA NY monogram) or White dress shirt with
- plain black tie with no pattern or a SkillsUSA black tie, or business like white collarless blouse or white blouse with small plain collar.
- Black dress slacks or black dress skirt (knee-length). Note: Wearing socks or hose is no longer required. If worn, socks must be black dress socks, and
- hose must be either black or skin-tone and seamless/nonpattern.
  Black leather shoes that are not backless or open toe

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

EQUIPMENT AND MATERIALS

1. Supplied by the NY chair/ committee:
    a. Flat table space approximately 18"x72"
    b. Chair
    c. 110-volt electric outlet(s)
    d. Internet access
2. Supplied by the competitor (These materials cannot be shared with other competitors.):
    a. A personal computer, monitor and input devices or a laptop computer. Laptop must have 5G Wi- Fi and Ethernet connection (Both 5G Wi-Fi and Ethernet adapters can be found on Amazon, if needed
    b. Technical software of choice
    c. (Optional) Machinery's Handbook and a maximum of three additional published reference books
    d. One 6' multiple-outlet surge protector
    e. Printer with toner/ ink
    f. Paper
    g. Pen and pencil
    h. All competitors must create a one-page resume. See "Resume Requirement" below

RESUME REQUIREMENT

Competitors must create a one-page resume to submit at orientation.

DEVICES

Cell phones or other electronic devices not approved by the NYS Chairperson will be collected by the contest chair during the competition. Chairpersons will announce their acceptance by listing it on their standard or at the orientation meeting. In case of emergencies advisors should allow the competitors to take their phones to the contest areas.

If the competitor uses their device in a manner which compromises the integrity of the competition, the competitor's score may be penalized.

SCOPE OF THE COMPETITION

The competition 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

All competitors are required to take the SkillsUSA professional development test online.

The competition will include a written exam that assesses technical drafting general knowledge (see standards and competencies). Competitors are also required to take the SkillsUSA professional development test at orientation.

SKILLPERFORMANCE

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

COMPETITION GUIDELINES

1. The competitors 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. Competitor-supplied computer aided drafting and design software is used.
3. The competitors work independently. No assistance may be given by other competitors, instructors, advisors, or observers.
4. All competitors start and finish at the same time. No one is allowed to work past the competition conclusion. If competitors are waiting to print after the competition conclusion, they are allowed to print one drawing only.
5. Competitors will store all their drawings in PDF format on supplied flash drives for printing.
6. Competitors' drawings are judged relative to pre-established criteria for each drawing in the drawing portfolio. The total competition points include points from the written exam(s) and drawings.

STANDARDS AND COMPETENCIES

The following items are included in the written exam and skill performance parts of the competition.

TD 1.0 — Create 3-D 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 3-D 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

See the ASME Y14.1 Drawing Sheet Size and Format standards, ASME Y14-100 Engineering Drawing Practices.

3.1. Recall and create inch and metric sized borders and title blocks

TD 4.0 — Demonstrate knowledge of different drawing types

See the ASME Y14.24 Types and Application of Engineering Drawings and ASME Y14.8 Castings, Forgings and Molded Part Drawings standards.

4.1. Describe and create 2-D 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 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 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 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 Dimensioning and Tolerancing standard.

8.1. Apply surface and size feature datums
8.2. Apply datum targets

TD9.0 — Apply general and geometricdimensions and tolerances to2-Dpart views.

See the ASME B4.1 Preferred Limits and Fits for Cylindrical Parts and ASME Y14.5 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 Automobile 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 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 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 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)