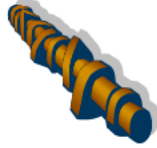


TECHNICAL DRAFTING NYS



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 REQUIREMENT

Men: Black dress trousers with white dress shirt; plain black tie with no pattern or a SkillsUSA black tie. Black socks and black shoes.

Women: Black dress slacks or skirt, with businesslike white, collarless blouse or white blouse with small, plain collar; black sheer or skin-tone seamless hose and black dress shoes, that are not backless or open toe.

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

EQUIPMENT AND MATERIALS

1. Supplied by the NY chair/ committee:
 - a. Table and chair workstation will be equipped with a flat table (approximately 24"x72"), a second table with space for a personal computer and a chair
 - b. 110-volt electric outlet
2. Supplied by the contestant:
 - a. A personal computer, monitor and input devices or a laptop computer
 - b. 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)
 - c. Machinery Handbook (this can be in book or CD form)

- d. Published computer-aided drafting reference books, software manuals, published technical drafting reference books, tables and calculators of your choice. Reference materials may not take up more than 1 cubic foot of space and may not be shared by contestants. No textbooks will be allowed.
- e. Output hardware — plotter or printer
 1. Plotter media
 2. Pens, ink or toner as required
- f. Pen and pencil
- g. Drafting paper/vellum
- h. 25 ft. Extension cord.
- i. All competitors must create a one-page resume and submit a hard copy to the contest committee chair at orientation. Failure to do so will result in a 10-point penalty.

Note: Your contest may also require a hard copy of your résumé as part of the actual contest. Check the Contest Guidelines and/or the updates page on the NYS SkillsUSA Web site:

<http://www.nysskillsusa.org/>

COMPUTER/SOFTWARE REQUIREMENTS

Contestants should have installed and/or set prior to 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* 10-Base T network. Vista is not allowed.

2. Printer Driver Information Hewlett Packard DeskJet 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.

There will be technicians on the floor the day of setup to assist you if you need help. They will have all forms of cables, software, drivers, etc., if needed.

SCOPE OF THE CONTEST

The contest will focus on the application of appropriate technical drafting skills to solve visualization and presentation problems of a mechanical nature as designed by the NY Chair/ committee.

Knowledge Performance

The contest will include a written knowledge

exam assessing technical drafting general knowledge.

Skill Performance

The contest will assess the ability to create 3-D models and extract properly scaled 2-D view 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 ten drawings.
2. 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 pre-established 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 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
 - 2.3

TD 3.0 — Demonstrate knowledge of drawing borders and title blocks

See the ASME Y14.1-2005 Decimal Inch Drawing Sheet Size and Formats, ASME Y14.1M-2005 Metric Drawing Sheet Size and Format standards, ASME Y14-100-2013 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 Y14.24-1999 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 Y14.2-2014 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 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 Y14.6-2001 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)