LEVEL UP 2026 - 2027

NYS SkillsUSA

INFORMATION TECHNOLOGY SERVICES

PURPOSE

The Information Technology Services competition is established to evaluate each competitor's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of information technology.

ELIGIBILITY

Open to active NYS SkillsUSA members enrolled in programs focused on computer maintenance technology, computer networking and security, or information technology services.

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, and safety assurance form.**

EQUIPMENT AND MATERIALS

1. Required materials supplied by the competition/technical committee:
   a. All software required for completing modules within the competition.
2. Required materials supplied by the competitor:
   a. Laptop computer with 5G Wi- Fi and Ethernet connection (Both 5G Wi-Fi and Ethernet adapters can be found on Amazon, if needed).
   b. Pencils/writing utensils
   c. 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 is defined by industry standards based off elements of the latest published CompTIA A+ certification. At the time of publishing this document in June 2022, those are the 1101 and 1102 versions. The competition also has elements from the CompTIA Network+ and Security+ certifications, as well as industry trends as collected by the technical committee.

KNOWLEDGE PERFORMANCE

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

This portion of the national competition will be a computer-based knowledge exam. Competencies evaluated on the written exam are congruent with those evaluated on the latest published version of the CompTIA A+ Certification exam.

SKILLPERFORMANCE

This portion of the competition will be a series of modules through which each competitor will rotate on a fixed time schedule to troubleshoot or complete tasks with client, server, or end user computing issues.

COMPETITION GUIDELINES

1. The competitions will have several hands-on skill scenarios that demonstrate a competitor's entry-level employment skills selected from the list of competencies as determined by the NYS SkillsUSA Championships technical committee. Scenarios may include but are not limited to the following:
    a. Diagnose and service client issues with their relation to network interaction.
    b. Diagnose and resolve operating system and startup problems.
    c. Demonstrate ability to use utility software, drives and other peripherals.
    d. Demonstrate knowledge and functions of components within a computer.
    e. Install, configure, and demonstrate proper operations of devices including desktop, laptop, tablets, and mobile devices.
    f. Demonstrate ability to create, manage and operate virtual machines.
    g. Demonstrate ability to remotely connect to and manage customer end points.
    h. Demonstrate ability to configure, interconnect and secure networks.
    i. Demonstrate interpersonal and customer service skills using service order management systems, service requests and statements of work while interacting in both consumer, consulting, and corporate practices.
    j. Demonstrate a working knowledge of information technology employment policies and observance of security best practices.
    k. Demonstrate an ability to use PowerShell, Linux/Bash, and Windows command-line skills.

COMPETITION SCORING

1. Competitors will be awarded points based on their ability to solve problems or complete tasks within the allotted time. Partial points will be awarded for solving partial problems.
2. Winners will be determined based on their total scores.
3. Penalties will be assessed for failure to follow a judge's or modules instructions.

STANDARDS AND COMPETENCIES

ITS 1.0—Perform maintenance on systems and components

1.1. Identify the fundamental principles of using computing devices
- 1.1.1. Identify the names, purposes, and characteristics of storage devices
- 1.1.2. Identify the names, purposes, and characteristics of motherboards
- 1.1.3. Identify the names, purposes, and characteristics of power supplies
- 1.1.4. Identify the names purposes and characteristics of processor/CPUs
- 1.1.5. Identify the names, purposes, and characteristics of memory
- 1.1.6. Identify the names, purposes, and characteristics of display devices
- 1.1.7. Identify the names, purposes, and characteristics of input devices
- 1.1.8. Identify the names, purposes, and characteristics of adapter cards
- 1.1.9. Identify the names, purposes and characteristics of ports and cables
- 1.1.10. Identify the names, purposes, and characteristics of cooling systems

1.2. Install, configure, optimize and upgrade system components
- 1.2.1. Add, remove, and configure internal and external storage devices
- 1.2.2. Install and configure graphical display devices
- 1.2.3. Add, remove, and configure basic input and multimedia devices

1.3. Identify tools, diagnostic procedures and troubleshooting techniques for systems and components
- 1.3.1. Recognize the basic aspects of troubleshooting
- 1.3.2. Identify and apply basic diagnostic procedures and troubleshooting techniques
- 1.3.3. Recognize and isolate issues with display, power, basic input devices, storage, memory, thermal, POST errors, peripherals, multimedia, specialty input devices, internal and external storage, and CPUs
- 1.3.4. Apply basic troubleshooting techniques to check for problems (e.g., thermal issues, error codes, power and connections including cables and/or pins, compatibility, functionality, software/drivers) with components
- 1.3.5. Recognize the names, purposes, characteristics, and appropriate application of tools, for example: BIOS, self-test, hard drive self- test and software diagnostics test
- 1.3.6. Identify the steps used to troubleshoot components (e.g., check proper seating, installation, appropriate components, settings, and current driver)
- 1.3.7. Recognize names, purposes, characteristics, and appropriate application of tools

1.4. Perform preventative maintenance on personal computer components
- 1.4.1. Identify and apply basic aspects of preventative maintenance theory
- 1.4.2. Identify and apply common preventive maintenance techniques for devices such as input devices and batteries

ITS 2.0—Perform maintenance procedures on laptops and mobile devices

2.1. Identify the fundamental principles of using laptops, tablets, and mobile devices
- 2.1.1. Identify names, purposes, and characteristics of laptop-specific devices
- 2.1.2. Identify and distinguish between mobile and desktop motherboards and processors including throttling, power management and Wi-Fi
- 2.1.3. Identify appropriate applications for laptop-specific communication connections such as Bluetooth, infrared, cellular WAN and Ethernet
- 2.1.4. Identify appropriate laptop- specific power and electrical input devices and determine how amperage and voltage can affect performance
- 2.1.5. Identify the major components of the LCD including inverter, screen, and video card

2.2. Install, configure, optimize and upgrade laptops and portable devices
- 2.2.1. Configure power management
- 2.2.2. Demonstrate safe removal of laptop-specific hardware such as peripherals, hot-swappable devices and non-hot-swappable devices
- 2.2.3. Remove laptop-specific hardware such as peripherals, hot- swappable and non-hot- swappable devices
- 2.2.4. Describe how video sharing affects memory upgrades

2.3. Identify tools, basic diagnostic procedures and troubleshooting techniques for laptops and mobile devices
- 2.3.1. Use procedures and techniques to diagnose power conditions, video, keyboard, pointer, and wireless card issues
- 2.3.2. Use tools, diagnostic procedures and troubleshooting techniques for laptops and mobile devices
- 2.3.3. Use procedures and techniques to diagnose power conditions, video, keyboard, pointer, and wireless card issues

2.4. Perform preventative maintenance on laptops and portable devices
- 2.4.1. Identify and apply common preventive maintenance techniques for laptops and mobile devices, for example: cooling devices, hardware and video cleaning materials, operating environments including temperature and air quality, storage, transportation, and shipping

ITS 3.0—Manage operating systems

3.1. Identify the fundamentals of using operating systems
- 3.1.1. Identify differences between operating systems (e.g., Mac, Windows, and Linux) and describe operating system revision levels including GUI, system requirements, application, and hardware compatibility
- 3.1.2. Identify names, purposes and characteristics of the primary operating system components including registry, virtual memory, and file system
- 3.1.3. Describe features of operating system interfaces
- 3.1.4. Identify the names, locations, purposes, and characteristics of operating system files
- 3.1.5. Identify concepts and procedures for creating, viewing, and managing disks, directories, and files in operating systems
- 3.1.6. Use command-line functions and utilities to manage operating systems, including proper syntax and switches
- 3.1.7. Locate and use operating system utilities and available switches

3.1.8. Describe the purposes, functions, and deployment methods with regard to operating system life cycles

3.2. Install, configure, optimize and upgrade operating systems
- 3.2.1. Identify procedures for installing and optimizing operating systems
- 3.2.2. Identify procedures for upgrading operating systems
- 3.2.3. Install/add a device including loading, adding device drivers, and required software
- 3.2.4. Identify procedures and utilities used to optimize operating systems for example, virtual memory, hard drives, temporary files, service, startup, and applications
- 3.2.5. Be able to manage Microsoft Windows, Macintosh OSX and POSIX based linux distributions
- 3.2.6. Identify every entry point where software can automatically be started on system boot.

3.3. Identify tools, diagnostic procedures and troubleshooting techniques for operating systems
- 3.3.1. Identify basic boot sequences, methods, and utilities for recovering operating systems
- 3.3.2. Identify and apply diagnostic procedures and troubleshooting techniques
- 3.3.3. Recognize and resolve common operational issues such as blue screen, system lock-up, input/output device, application install, start, or load and Windows-specific printing problems (e.g., print spool stalled, incorrect/incompatible driver for printer)
- 3.3.4. Explain common error messages and codes
- 3.3.5. Identify the names, locations, purposes, and characteristics of operating system utilities
- 3.3.6. Demonstrate the ability to recover operating systems (e.g., boot methods, recovery console, ASR, ERD)
- 3.3.7. Use diagnostic utilities and tools to resolve operational problems

3.4. Perform preventative maintenance on operating systems
- 3.4.1. Describe common utilities for performing preventative maintenance on operating systems; for example, software and Windows updates (e.g., service packs), scheduled backups/restore and restore points
- 3.4.2. Demonstrate the ability to perform preventative maintenance on operating systems including software and Windows updates (e.g., service packs), scheduled backups/restore and restore points
- 3.4.3. Describe purpose and benefits of cloud storage and backups
- 3.4.4. Restore user backups non-destructively without file loss

ITS 4.0—Install and configure printers and scanners successfully

4.1. Identify the fundamental principles of using printers and scanners
- 4.1.1. Identify differences between types of printer and scanner technologies
- 4.1.2. Identify names, purposes and characteristics of printer and scanner components and consumables
- 4.1.3. Identify the names, purposes and characteristics of interfaces used by printers and scanners including port and cable types
- 4.1.4. Describe processes used by printers and scanners including laser, ink dispersion, thermal, solid ink and impact printers and scanners

4.2. Identify basic concepts of installing, configuring, optimizing, and upgrading printers and scanners
- 4.2.1. Install and configure printers/scanners
- 4.2.2. Optimize printer performance; for example, printer settings such as tray switching, print spool settings, media types and paper orientation, resolution, file format and default settings
- 4.2.3. Optimize scanning devices using proper calibration and resolution settings

4.3. Identify tools, basic diagnostic procedures and troubleshooting techniques for printers and scanners
- 4.3.1. Gather information about printer/scanner problems
- 4.3.2. Review and analyze collected data
- 4.3.3. Identify solutions to identified printer/scanner problems
- 4.3.4. Isolate and resolve an identified printer/scanner problem including defining the cause, applying the fix, and verifying functionality
- 4.3.5. Identify appropriate tools used for troubleshooting and repairing printer/scanner problems

ITS 5.0 — Apply knowledge of networking and security principles to install, configure, optimize, upgrade, troubleshoot and secure networks

5.1. Identify the fundamental principles of networks
- 5.1.1. Describe basic networking concepts
- 5.1.2. Identify names, purposes, and characteristics of the common network cables
- 5.1.3. Identify names, purposes, and characteristics of network connectors
- 5.1.4. Identify names, purposes, and characteristics of technologies for establishing connectivity
- 5.1.5. Identify names, purposes and characteristics of basic network protocols and terminologies
- 5.1.6. Identify names, purposes, and functions of the OSI seven-layer model
- 5.1.7. Identify names, purposes, and functions of the TCP/IP four-layer model
- 5.1.8. Compare and contrast the functions of the OSI seven-layer model with functions of the TCP/IP four-layer model
- 5.1.9. Identify names, purposes, and characteristics of network topologies

5.2. Install, configure, optimize, and upgrade networks
- 5.2.1. Install and configure bare metal or virtual network interfaces
- 5.2.2. Install, identify and obtain wired and wireless connections
- 5.2.3. Install, configure, and secure internet browsers
- 5.2.4. Establish network connectivity with bare metal or virtual interfaces
- 5.2.5. Demonstrate the ability to share network resources
- 5.2.6. Demonstrate the ability to identify interfaces by media access control address (MAC), TCP/IP address and Address Resolution Protocol (ARP)
- 5.2.7. Demonstrate the ability to optimize networks by identifying and correcting poor performance
- 5.2.8. Describe the functions and purposes of static and dynamic addressing
- 5.2.9. Demonstrate the ability to determine number of network hosts through the process of subnetting
- 5.2.10. Demonstrate the process of improving network performance by separating network traffic

5.3. Identify tools, diagnostic procedures and troubleshooting techniques for networks
- 5.3.1. Explain status indicators, for example: speed, connection and activity lights and wireless signal strength
- 5.3.2. Identify names, purposes and characteristics of tools used to troubleshoot physical layer network issues
- 5.3.3. Diagnose and troubleshoot basic network issues using commands in Windows CLI, Windows PowerShell, Linux Bash, and/or Cisco IOS,
- 5.3.4. Diagnose and troubleshoot basic network issues by identifying network scope and misconfigurations
- 5.3.5. Describe the purpose and functions of the domain name system (DNS) and hostname resolution

5.4. Apply measures to secure networks
- 5.4.1. Describe the purpose and functions of network address translations (NAT)
- 5.4.2. Describe the purpose and functions of access lists (ACL)
- 5.4.3. Describe the purpose and functions of authentication, authorization, and accounting framework (AAA)
- 5.4.4. Describe secure methods required to connect to network devices
- 5.4.5. Describe additional security measures taken to secure devices such as virtual terminal connections and timeouts

ITS 6.0 — Provide security measures for systems

6.1. Identify the fundamental principles of security
- 6.1.1. Identify names, purposes and characteristics of hardware and software security
- 6.1.2. Identify names, purposes, and characteristics of wireless security
- 6.1.3. Identify names, purposes and characteristics of data and physical security
- 6.1.4. Describe importance and process of incidence reporting
- 6.1.5. Describe importance and process of forensics
- 6.1.6. Contrast the processes of incidence reporting versus forensics
- 6.1.7. Recognize and respond appropriately to social engineering situations
- 6.1.8. Identify the purposes and characteristics of access control
- 6.1.9. Identify the purposes and characteristics of auditing and event logging
- 6.1.10. Contrast the sequences of security processes and determine when they are relevant
- 6.1.11. Describe the process of risk management
- 6.1.12. Describe the purpose and methods related to sandbox testing
- 6.1.13. Outline the importance of employee education on protecting information and data through policy compliance

6.2. Install, configure, upgrade, and optimize security
- 6.2.1. Install, configure, upgrade, and optimize hardware, software, and data security
- 6.2.2. Install and configure software, wireless and data security

6.3. Identify tool, diagnostic procedures and troubleshooting techniques for security
- 6.3.1. Diagnose and troubleshoot hardware, software, and data security issues
- 6.3.2. Diagnose and troubleshoot software and data security issues

6.4. Perform preventative maintenance for computer security
- 6.4.1. Implement software security preventative maintenance techniques such as installing service packs and software patches

6.4.2. Implement software security measures for protecting systems against malware and viruses
6.4.3. Describe and identify the purpose of scan settings including real-time, scheduled and on-demand scanning and demonstrate when each method is required
6.4.4. Demonstrate file and folder level scanning exclusions versus the operational requirements of applications
6.4.5. Demonstrate the ability to configure software or hardware firewall settings based on port, service, and application
6.4.6. Demonstrate the ability to configure software or hardware firewall settings based on MAC or IP filtering
6.4.7. Identify resources to safely inspect files and URLs
6.4.8. Demonstrate containment methods when a virus or malware has been introduced and is propagating in a networked environment
6.4.9. Demonstrate training of users about malicious software prevention technologies

ITS 7.0—Apply awareness of safety and environmental concerns surrounding information technology

7.1. Describe the aspects and importance of safety and environmental issues
7.1.1. Identify potential safety hazards and take preventative action
7.1.2. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation
7.1.3. Use appropriate repair tools
7.1.4. Describe methods to handle environmental and human (e.g., electrical, chemical, physical) accidents including incident reporting
7.2. Identify potential hazards and implement proper safety procedures including ESD precautions and procedures, safe work environment and equipment handling
7.3. Identify proper disposal procedures for batteries, display devices and chemical solvents and cans.

ITS 8.0—Display communication and professionalism while working in information technology

8.1. Use effective communication skills, including listening and tact/discretion, when communicating with customers and colleagues
8.1.1. Use clear, concise, and direct statements
8.1.2. Allow the customer to complete statements — avoid interrupting
8.1.3. Clarify customer statements — ask pertinent questions
8.1.4. Avoid using jargon, abbreviations, and acronyms
8.1.5. Listen to customers
8.2. Use job-related professional behavior including notation of privacy, confidentiality and respect for the customer and customer's property
8.2.1. Identify workplace policies regarding the protection of customer or personal information
8.2.2. Identify workplace policies regarding handling of inappropriate content or material
8.2.3. Identify workplace policies regarding safeguarding data with end-of-lifecycle technology
8.2.4. Identify workplace policies regarding electronic communications in workplace and in personal settings

8.2.5. Identify workplace policies regarding distribution of company information internal to company operations
8.2.6. Identify workplace policies regarding use of wireless communication

8.3. Use job-related workplace behavior when servicing customers regarding:
8.3.1. Verifying customer or employee identification
8.3.2. Resetting customer or employee credentials
8.3.3. Protecting customer or employee data
8.3.4. Identifying and defining the security risks associated with the use of an external product or service
8.3.5. Verify source of information and/or trusted material
8.3.6. Providing information in electronic format
8.3.7. Documenting actions taken and customer communication in a ticketing/support system