STRANDS AND STANDARDS

INTRODUCTION TO INFORMATION TECHNOLOGY & CYBERSECURITY (Intro to IT & Cyber)

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Course Description

The Intro to Information Technology & Cybersecurity (Intro to IT & Cyber) is designed for students interested in exploring careers in the field of Information Technology. Students will be introduced to various domains within the field of IT to help identify their areas of interest. Through hands-on assignments and projects, students will gain foundational knowledge in IT careers, hardware and operating systems, communications and networking, cybersecurity, software development, databases, and emerging technologies.

Intended Grade Level	9-12
Units of Credit	0.5
Core Code	35.02.00.00.005
Concurrent Enrollment Core Code	35.02.00.13.005
Prerequisite	None
Skill Certification Test Number	801 You can also view the test chart HERE for industry exams
Skill Certification Cut Score	**73%**
Test Weight	0.5
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Cybersecurity
Endorsement 2	Information Technology Systems
Endorsement 3	Programming & Software Development
Endorsement 4	Technology
Endorsement 5	Web Development

Updated: August 2025

STRAND 1

Foundational IT Concepts and Device Components

Students will understand the basic components of computers, IT terminology, and troubleshooting methodologies.

Standard 1

Students are introduced to the importance of ethics and ethical behavior.

- Understand and follow an Acceptable Use Policy (AUP)
- Explain the difference between legal and ethical
- Explain how some online behaviors can be harmful personally and to a business (Pornography, social networking, gaming, pirating software, illegal hacking)
- Follow copyright and fair use guidelines

Standard 2

Understand the importance of information privacy and security.

- Viruses, spoofing, phishing, cookies, spam
- Explain different kinds of anti-virus software and how they work

Standard 3

Recognize and Explain Basic Computer Components.

- Recognize and explain functions of basic computer components: RAM, CPU/APU (x86 [32-bit and 64-bit], ARM), Graphics Card, Physical Storage, Motherboard
- Explain the basics of computing: input, processing, output, storage

Standard 4

Identify Notational Systems and Units of Measure.

- Identify notational systems: binary, hexadecimal, decimal, octal
- Convert numbers between 0 to 128 from decimal to binary and vice-versa
- Compare standard units of measure:
  - Storage: Bit, Byte, KB, MB, GB, TB, PB
  - Processing Speed: MHz, GHz
  - Throughput: bps, Kbps, Mbps, Gbps, Tbps

Standard 5

Compare and Understand Storage Types.

- Compare storage types: volatile vs. non-volatile, optical, local storage (external flash, RAM, ROM, storage drive, magnetic disks/HDD, SSD, NVMe), and local network storage (NAS, file server)

Standard 6

Learn and demonstrate use of the Troubleshooting Methodology throughout the course.

- Methodology:
  - Identify the problem
  - Establish a theory of probable cause
  - Test the theory to determine the cause
  - Establish a plan of action and implement the solution
  - Verify full system functionality and implement preventive measures
  - Document findings, actions, and outcomes
- Gather data and determine when to escalate issues

Performance Skills

- Define and demonstrate ethical behavior.
- Demonstrated proper handling techniques of hardware components.
- Disassemble and rebuild a computer system either individually, in teams, or with the instructor.

STRAND 2

Operating Systems and Software Management

Students will manage operating systems, applications, and general software.

Standard 1

OS Installation and Core Management (This can be done as a demonstration, a simulation, etc.).

- Install and configure Windows, including user accounts, basic desktop settings (e.g., Start menu, display, taskbar), and accessibility options
- Manage OS and device driver updates
- Explain the purpose of the Windows Registry
- Identify core OS components, including file systems, utilities (such as services and drivers), interfaces (such as GUI and command line), and permissions

Standard 2

Application and Software Usage.

- Manage application installations, including permissions and removal
- Understand the purpose and proper use of productivity, collaboration, web browsing, and remote support software
- Configure web browser features, including private browsing, extensions/add ons, cache clearing, and password management

Standard 3

Basic System Troubleshooting.

- Utilize basic Windows troubleshooting tools: Event Viewer, Task Manager, Defragment/Optimize Drive
- Troubleshoot OS and application issues: reset/roll back OS, advanced startup (System repair), Safe Mode features, identify app compatibility, resolve Store app installation, reinstall/repair desktop apps, troubleshoot services, use Task Manager (turn off startup app, end task, manage service)
- Manage and troubleshoot hardware/peripherals: utilize hardware troubleshooting methods (connections, ports, power), update/roll back drivers, uninstall/reinstall a device to reconfigure drivers, and understand the purpose and capabilities of Device Manager/Disk Management

Standard 4

Learn about careers and educational opportunities in Systems Administration and Support.

- Explore certification options in Systems Administration & IT Support
- Explore education and work experience that can lead to System Administration & IT Support careers
- Identify Systems Administration career opportunities (Systems Administrator, IT Support, Cloud Administrator, DevOps Engineer, etc). and the roles of each

Performance Skills

- Install, configure, and manage operating systems and software applications by adjusting system settings, managing updates and drivers, and applying best practices for software use and browser configuration.
- Troubleshoot system and application issues using built-in tools and methods, and demonstrate the ability to manage hardware and peripheral devices through effective diagnostic and repair techniques.

STRAND 3

Device Connectivity and Peripherals

Students will understand various peripheral connection types and how to configure display properties and install peripheral devices.

Standard 1

Understand Peripheral Connections.

- Compare peripheral connection types: HDMI (full, mini, micro), DisplayPort (full, mini), DVI family, VGA, USB (A, mini-A, micro-A, B, mini-B, micro-B, C, 3.0), Thunderbolt, S/PDIF Optical, and aux audio cable, as well as conversion types
- Compare input/output device interfaces:
  - Networking (Wired): Ethernet (RJ45), Fiber (SFP)
  - Networking (Wireless): Bluetooth, NFC, 802.11X
  - Peripheral Devices: USB (A/B/C), Thunderbolt, Bluetooth, RF, Lightning
  - Display Ports: VGA, DVI, HDMI, DisplayPort, USB-C

Standard 2

Configure Peripherals and Displays.

- Configure projection/display properties, including wireless casting, orientation, duplication vs. extension, resolution, and aspect ratio
- Install and configure standard peripheral devices, including printers, scanners, keyboards, mice, webcams, external drives, speakers/headsets, and displays (such as Smart TVs, projectors, and monitors)
- Understand the various peripheral installation types, including plug-and-play versus driver installation, additional steps required, IP-based peripherals, and web-based configuration steps

Performance Skills

- Identify and compare various peripheral connection types and device interfaces—including display, audio, and networking ports—and explain their functions and compatibility across different technologies.
- Install and configure peripheral devices and display systems by applying appropriate setup procedures, adjusting projection properties, and troubleshooting installation types such as plug-and-play, driver-based, and IP/web-based configurations.

STRAND 4

Networks & Communication

Students will understand network connections, services, and basic network configuration.

Standard 1

Compare common network devices and purposes.

- Network devices such as smartphones, tablets, e-readers, laptops, workstations, servers, gaming consoles, VR/AR systems, etc.
- Internet of Things (IoT) devices such as home appliances, automation, thermostats, etc.
- Network hardware such as modems, routers, switches, access points, firewalls, network interface cards (NIC)
- Explore configuration of these various devices

Standard 2

Explore and understand basic networking concepts and services.

- Understand and describe how the Internet is a network system
- Compare common internet service types: fiber optic, cable, DSL, wireless (RF, satellite, cellular)
- Identify & describe network medium types (twisted pair, unshielded twisted pair (UTP), CAT 6, wireless, Bluetooth, fiber optic, cellular LTE, satellites)
- Describe how packets are used to send and receive data
- Understand that network protocols are a set of rules
- Identify common network protocols (TCP/IP, FTP, HTTP, HTTPS, etc.)
- Identify and describe common networking models: client/server, peer-to-peer, star, mesh, etc.
- Examine the uses of a LAN (local area network), WAN (wide area network), and MAN (metropolitan area network)
- Troubleshoot wired and wireless network connections using tools like ipconfig and ping

Standard 3

Explore and understand wireless technologies

- Compare and contrast wired, wireless, and cell networks
- Explain basic small wireless network capabilities
- Wireless access points, bridges, extenders and Wireless LAN Controllers
- 802.11 standards, including n/ac/ax
- Speed & interference/attenuation considerations, including band options & ramifications (2.4GHz, 5GHz, 6GHz)

Standard 4

Compare and understand Virtualization and Cloud technologies.

- Hypervisor vs Virtual Machine (Guest OS)
- Cloud Services: SaaS, PaaS, IaaS
- Deployment models: cloud, hybrid, and on-premises
- Utilize a local or online sandbox environment like cyber.org to explore virtualization

Standard 5

Learn about careers and educational options in Networking.

- Explore certification options in Networking
- Explore education and work experience that can lead to IT Network careers
- Identify Networking career opportunities (Network Administration, Network Engineer, Network Architect, VoIP Engineer, etc.) and the roles of each.

Performance Skills

- Demonstrate an understanding of network systems by identifying and configuring various devices and technologies—including hardware, wireless standards, and cloud services—and explaining their roles in modern communication networks.
- Apply foundational networking concepts to troubleshoot connections, compare service types and protocols, and explore career pathways in IT networking through hands-on activities and research-based presentations.

STRAND 5

Security

Students will be introduced to essential cybersecurity concepts, including threats, defenses, and responsible digital practices.

Standard 1

Understand Core Security & Cyberspace.

- Explain the Confidentiality, Integrity, and Availability (CIA) Triad
- Describe physical security deterrents controls like fencing, cameras, keycard systems, biometric scanners, etc.
- Describe key security threats like malware (viruses, ransomware), social engineering (phishing) and physical attacks
- Recognize the global nature of the Internet and its associated data protection challenges
- Understand the role of ethics in cybersecurity

Standard 2

Manage Access & Authentication.

- Describe user authentication methods, including multifactor authentication and biometrics
- Explain password best practices (complexity, length, history)
- Understand permissions and the principle of least privilege
- Manage User Account Control (UAC) settings

Standard 3

Secure Devices, Networks, & Data.

- Understand the concepts in “Computational Thinking”
- Implement anti-malware and configure firewall settings
- Secure wireless networks by changing SSID and passwords, and understanding encryption types (WPA, WPA2, WPA3)
- Identify uses of encryption for data at rest and in transit (HTTPS, VPN)
- Explain data backup concepts and privacy considerations (PII, GDPR)
- Understand safe browsing practices (certificates)

Standard 4

Troubleshoot & Respond to Incidents.

- Apply a basic troubleshooting methodology (identify the problem, establish a theory, test theory, implement solution, verify system functionality, document results)
- Describe how to respond to malware and social engineering attacks
- Participate in a cybersecurity activity such as Capture the Flag challenges, table top attack scenario, or other online simulation

Standard 5

Learn about careers and educational options in Cybersecurity.

- Explore certification options in Cybersecurity
- Explore education and work experience that can lead to Cybersecurity careers
- Identify Cybersecurity career opportunities (Network Security, Security Engineer, Forensic Analyst, Penetration Tester, etc.) and the roles of each

Performance Skills

- Apply cybersecurity principles to identify threats, manage authentication, secure systems, and respond to incidents using tools and techniques such as firewalls, encryption, and troubleshooting methodologies.
- Demonstrate responsible digital practices by evaluating ethical considerations, understanding global data protection challenges, and exploring career pathways and certifications in cybersecurity.

STRAND 6

Software and Applications

Students will understand software development, databases, and AI concepts.

Standard 1

Understand the evolution and use of varied software development languages.

- Describe the difference between for interpreted, compiled, markup, scripting, and assembly languages
- Identify basic kinds of programming (modular, procedure, & object-oriented programming (OOP))

Standard 2

Understand the basic structures and controls used in programming

- Understand and use different data types, including char, strings, numbers (integers, floats), and Boolean
- Understand the use of variables, constants, arrays, functions, loops, and objects
- Write a basic program utilizing pseudocode and a flowchart

Standard 3

Create a basic application using a programming language (MIT Scratch, C#, Python, AppLab, PencilCode, JavaScript, TouchDevelop, Java, Swift, Snap!, etc.).

- Understand and use good principles of design for the user experience (UX) and the user interface (UI)
- Understand and use programming conventions (indentation, capitalization, etc.)
- Understand and use: inputs, outputs, variables, data types, operators, Booleans, loops, functions, comments, etc.
- Publish or share your project with others

Standard 4

Understand database concepts to create and use a database.

- Identify several databases that students may be a part of (school SIS (grading system), bank, SSN, IRS, state driver's license)
- Identify several databases that can be accessed on the Internet (search engines, white pages, Facebook, real estate listings)
- Understand the value of databases, including monetization, reporting, and data-driven decisions
- Understand basic vocabulary associated with a database (relational vs. non-relational, flat-file, table, rows, record, field, query, select, sort, report, primary/foreign keys)
- Create a flat file database, enter, edit, and delete records

Standard 5

Understand the basics of Artificial Intelligence

- Understand and describe the differences between the types of Artificial Intelligence (AI): chatbots, assistants, and generative AI
- Discuss the future of AI, including its impact on society, careers, and ethical concerns
- Discuss prompting and how your prompt will affect your outcome

Standard 6

Learn about careers and educational options in Software and Application Development.

- Explore certification options in Software and Application Development.
- Explore education and work experience that can lead to Software and Application Development careers.
- Identify Software and Application Development career opportunities (Software Developer, Database Administrator, AI Product Manager, etc.) and the roles of each.

Performance Skills

- Design and develop basic software applications by applying programming principles, using appropriate languages and tools, and incorporating user interface and experiencing best practices.
- Demonstrate a foundational understanding of databases and artificial intelligence by creating and interacting with data systems and evaluating the role of AI in technology and society.

Skill Certification Test Points by Strand

Will be updated after the skills exam revision is completed.