GeorgiaStandards.Org
GATEWAY TO EDUCATION & PROFESSIONAL RESOURCES
One Stop Shop For Teachers

PROGRAM CONCENTRATION: Business & Computer Science
CAREER PATHWAY(S):   Computer Networking
                                                     Computer Systems and Support
COURSE TITLE: Information Technology Essentials

Course Description: This course provides students with the skills necessary to diagnose and correct problems that computer users encounter. Students will obtain the skills and knowledge necessary to install, build, upgrade, repair, configure, troubleshoot, and perform preventative maintenance on personal computer hardware and operating systems. Students will receive practical, hands-on experience in installing, maintaining, and troubleshooting computer hardware and software.

PERSONAL COMPUTER COMPONENTS

Students will identify the fundamental principles of using personal computers and the installation, configuration, optimization, and upgrade of personal computer components. Students will also identify the tools, diagnostic procedures, and troubleshooting techniques for repairing personal computer components, as well as for performing preventive maintenance.

BCS-ITE-1. Students will identify the fundamental principles of using personal computers.

   a. Identify the names, purposes, and characteristics of storage devices.
   b. Identify the names, purposes, and characteristics of motherboards.
   c. Identify the names, purposes, and characteristics of power supplies.
   d. Identify the names, purposes, and characteristics of processor/CPUs.
   e. Identify the names, purposes, and characteristics of memory.
   f.   Identify the names, purposes, and characteristics of display devices.
   g. Identify the names, purposes, and characteristics of input devices.
   h. Identify the names, purposes, and characteristics of adapter cards.
   i.   Identify the names, purposes, and characteristics of ports and cables.
   j.   Identify the names, purposes, and characteristics of cooling systems.

BCS-ITE-2. Students will install, configure, optimize, and upgrade personal computer components.

   a. Add, remove, and configure internal and external storage devices.
   b. Drive preparation of internal storage devices including format/file systems and imaging technology.
   c. Install display devices.
   d. Add, remove, and configure basic input and multimedia devices.
   e. Recognize and isolate issues with display, power, basic input devices, storage, memory, thermal, and POST errors (e.g. BIOS, hardware).

f. Apply basic troubleshooting techniques to check for problems (e.g. thermal issues, error codes, power connections including cables and/or pins, compatibility, functionality, software/drivers) with components.

BCS-ITE-3. Students will identify tools, diagnostic procedures and troubleshooting techniques for personal computer components.

a. Recognize the basic aspects of troubleshooting theory.
b. Identify and apply basic diagnostic procedures and troubleshooting techniques.
c. Recognize and isolate issues with display, power, basic input devices, storage, memory, thermal, and POST errors (e.g. BIOS, hardware).
d. Apply basic troubleshooting techniques to check for problems (e.g. thermal issues, error codes, power connections including cables and/or pins, compatibility, functionality, software/drivers) with components.
e. Recognize the names, purposes, characteristics, and appropriate application of tools

BCS-ITE-4. Students will perform preventive maintenance on personal computer components.

a. Identify and apply basic aspects of preventive maintenance theory.
b. Identify and apply common preventive maintenance techniques for devices such as input devices and batteries.

Academic Standards:
ELA10RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

ELA10LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

SCSH3 Students will identify and investigate problems scientifically.

LAPTOPS AND PORTABLE DEVICES
Students will identify fundamental principles of using laptops and portable devices. Students will be able to install, configure, optimize, and upgrade laptops and portable devices. Students will demonstrate tool identification, diagnostic procedures, and troubleshooting techniques for laptops and portable devices, as well as perform preventive maintenance on laptops and portable devices.

BCS-ITE-5. Students will identify fundamental principles of using laptops and portable devices.

   a. Identify names, purposes, and characteristics of laptop-specific hardware.
   b. Identify and distinguish between mobile and desktop motherboards and processors including throttling, power management, and WiFi.

BCS-ITE-6. Students will install, configure, optimize, and upgrade laptops and portable devices.

   a. Configure power management.
   b. Demonstrate safe removal of laptop-specific hardware such as peripherals, hot-swappable devices, and non-hot-swappable devices.

BCS-ITE-7. Students will identify tools, basic diagnostic procedures, and troubleshooting techniques for laptops and portable devices.

   a. Use procedures and techniques to diagnose power conditions, video, keyboard, pointer, and wireless card issues.

BCS-ITE-8. Students will perform preventive maintenance on laptops and portable devices.

   a. Identify and apply common preventive maintenance techniques for laptops and portable devices.

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ELA10RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

ELA10LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

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OPERATING SYSTEMS
Students will be able to identify the fundamental principles of operating systems. Students will be able to demonstrate installation, configuration, optimization, and upgrades of operating systems. Students will demonstrate tool identification, diagnostic

procedures, and troubleshooting techniques for laptops and portable devices, as well as perform preventive maintenance on laptops and portable devices.

BCS-ITE-9. Students will identify the fundamental principles of operating systems.

a. Identify differences between operating systems (e.g. Mac, Windows, Linux) and describe operating system revision levels including GUI, system requirements, application, and hardware compatibility.
b. Identify names, purposes, and characteristics of the primary operating system components including registry, virtual memory, and file system.
c. Describe features of operating system interfaces.
d. Identify the names, locations, purposes, and characteristics of operating system files.
e. Identify concepts and procedures for creating, viewing, managing disks, directories, and files in operating systems.

BCS-ITE-10. Students will install, configure, optimize, and upgrade operating systems.

a. Identify procedures for installing operating systems.
b. Identify procedures for upgrading operating systems.
c. Install/add a device including loading and adding device drivers and required software.
d. Identify procedures and utilities used to optimize operating systems.

BCS-ITE-11. Students will identify tools, diagnostic procedures, and troubleshooting techniques for operating systems.

a. Identify basic boot sequences, methods, and utilities for recovering operating systems.
b. Identify and apply diagnostic procedures and troubleshooting techniques.
c. 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 print).
d. Explain common error messages and codes.
e. Identify the names, locations, purposes, and characteristics of operating system utilities.

BCS-ITE-12. Students will perform preventive maintenance for operating systems.

a. Describe common utilities for performing preventive maintenance on operating systems: for example, software and Windows updates (e.g. service packs), scheduled backups/restore, and restore points.

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<u>PRINTERS AND SCANNERS</u>

Students will be able to identify the fundamental principles of printers and scanners. Students will be able to demonstrate installation, configuration, optimization, and upgrades of printers and scanners. Students will demonstrate tool identification, diagnostic procedures, and troubleshooting techniques for printers and scanners, as well as perform preventive maintenance on printers and scanners.

BCS-ITE-13. Students will identify the fundamental principles of using printers and scanners.

   a. Identify differences between types of printer and scanner technologies (e.g. laser, inkjet, thermal, solid ink, impact).
   b. Identify names, purposes, and characteristics of printer and scanner components: memory, driver, firmware, and consumables (e.g. toner, ink cartridge, paper).
   c. Identify the names, purposes, and characteristics of interfaces used by printers and scanners including port and cable types.

BCS-ITE-14. Students will identify basic concepts of installing, configuring, optimizing, and upgrading printers and scanners.

   a. Install and configure printers/scanners.
   b. Optimize printer performance (for example - printer settings such as tray switching, print spool settings, device calibration, media types, and paper orientation).

BCS-ITE-15. Students will identify tools and diagnostic procedures to troubleshoot printers and scanners.

   a. Gather information about printer/scanner problems.

b. Review and analyze collected data.
c. Identify solutions to identified printer/scanner problems.

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ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

ELA10LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

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NETWORKS
Students will be able to identify the fundamental principles of networking. Students will be able to demonstrate installation, configuration, optimization, and upgrades of networking. Students will demonstrate tool identification, diagnostic procedures, and troubleshooting techniques for networking, as well as perform preventive maintenance on networks.

BCS-ITE-16. Students will identify the fundamental principles of networks.

a. Describe basic networking concepts.
b. Identify names, purposes, and characteristics of the common network cables.
c. Identify names, purposes, and characteristics of network connectors (e.g. RJ45 and RJ11, ST/SC/LC, MT-RJ).
d. Identify names, purposes, and characteristics (e.g. definition, speed and connections) of technologies for establishing connectivity.

BCS-ITE-17. Students will install, configure, optimize, and upgrade networks.

a. Install and configure network cards (physical address).
b. Install, identify, and obtain wired and wireless connection.

BCS-ITE-18. Students will identify tools, diagnostic procedures, and troubleshooting techniques for networks.

a. Explain status indicators (for example - speed, connection and activity lights, and wireless signal strength).

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ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

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<u>SECURITY</u>

Students will be able to identify the fundamental principles of data security. Students will be able to demonstrate installation, configuration, optimization, and upgrades of security measures. Students will demonstrate tool identification, diagnostic procedures, and troubleshooting techniques for data security, as well as perform preventive maintenance for computer security.

BCS-ITE-19. Students will identify the fundamentals and principles of security.

a. Identify names, purposes, and characteristics of hardware and software.
b. Identify names, purposes, and characteristics of wireless security.
c. Identify names, purposes, and characteristics of data and physical security.
d. Describe importance and process of incident reporting.
e. Recognize and respond appropriately to social engineering situations.

BCS-ITE-20. Students will install, configure, upgrade, and optimize security.

a. Install, configure, upgrade, and optimize hardware, software, and data security.

BCS-ITE-21. Students will identify tools, diagnostic procedures, and troubleshooting techniques for security.

a. Diagnose and troubleshoot hardware, software, and data security issues.

BCS-ITE-22. Students will perform preventive maintenance for computer security.

a. Implement software security preventive maintenance techniques such as installing service packs and patches and training users about malicious software prevention technologies.

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ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

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SAFETY AND ENVIRONMENTAL
Students will describe the aspects and importance of safety and environmental issues. Students will also identify potential hazards in the workplace and implement proper safety procedures including ESD precautions and procedures, safe work environments, and equipment handling.

BCS-ITE-23. Students will describe the aspects and importance of safety and environmental issues.

   a. Identify potential safety hazards and take preventive action.
   b. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation.
   c. Use appropriate repair tools.
   d. Describe methods to handle environmental and human (e.g. electrical, chemical, physical) accidents including incident reporting.

BCS-ITE-24. Students will identify potential hazards and implement proper safety procedures including BCS-ITE-1ESD precautions and procedures, safe work environment, and equipment handling.

   a. Know safety and handling procedures and disposal requirements for batteries, display devices, and chemical solvents and cans.

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ELA10RL5 The student understands and acquires new vocabulary and uses it correctly in reading and writing.

ELA10RC3 The student acquires new vocabulary in each content area and uses it correctly.

ELA10RC4 The student establishes a context for information acquired by reading across subject areas.

ELA10LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

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COMMUNICATION AND PROFESSIONALISM

Students will use good communications skills when communicating with customers and colleagues and demonstrate listening skills, tact, and discretion as well as professional ethics in regards to privacy, confidentiality, and respect for customers and their property.

BCS-ITE-25. Students will use good communication skills including listening and tact/discretion when communicating with customers and colleagues.

   a. Use clear, concise, and direct statements.
   b. Allow the customer to complete statements – avoid interrupting.
   c. Clarify customer statements – ask pertinent questions.
   d. Avoid using jargon, abbreviations, and acronyms.
   e. Listen to customers.

BCS-ITE-26. Students will use job-related professional behavior including notation of privacy, confidentiality, and respect for the customer and customers' property.

   a. Show professional behavior towards customers and their property.

Academic Standards:
ELA10W1 The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals closure.

ELA10W3 The student uses research and technology to support writing.

ELA10RL4 The student employs a variety of writing genres to demonstrate a comprehensive grasp of significant ideas in sophisticated literary works. The student composes essays, narratives, poems, or technical documents.

Reading Across the Curriculum

Reading Standard Comment
After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal learning. Students encounter a variety of informational as well as fictional texts, and they

experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in *context*.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

CTAE-RC-1 Students will enhance reading in all curriculum areas by:
Reading in All Curriculum Areas
-Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
-Read both informational and fictional texts in a variety of genres and modes of discourse.
-Read technical texts related to various subject areas.
Discussing Books
-Discuss messages and themes from books in all subject areas.
-Respond to a variety of texts in multiple modes of discourse.
-Relate messages and themes from one subject area to messages and themes in another area.
-Evaluate the merit of texts in every subject discipline.
-Examine author's purpose in writing.
-Recognize the features of disciplinary texts.
Building Vocabulary Knowledge
-Demonstrate an understanding of contextual vocabulary in various subjects.
-Use content vocabulary in writing and speaking.
-Explore understanding of new words found in subject area texts.
Establishing Context
-Explore life experiences related to subject area content.
-Discuss in both writing and speaking how certain words are subject area related.
-Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and post secondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.