Ohio CTE

Introduction to Information Technology (2025)

Business Operations/21st Century Skills: Learners apply principles of economics, business management, marketing, and employability in an entrepreneur, manager, and employee role to the leadership, planning, developing, and analyzing of business enterprises related to the career field. 1

1.1 Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings. 1.1

- 1.1.1 Identify the knowledge, skills, and abilities necessary to succeed in careers. 1.1.1
- 1.1.2 Identify the scope of career opportunities and the requirements for education, training, certification, licensure, and experience. 1.1.2
- 1.1.3 Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options. 1.1.3
- 1.1.4 Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships. 1.1.4
- 1.1.5 Develop strategies for self-promotion in the hiring process (e.g., filling out job applications, resumé writing, interviewing skills, portfolio development). 1.1.5
- 1.1.6 Explain the importance of work ethic, accountability and, responsibility and demonstrate associated behaviors in fulfilling personal, community, and workplace roles. 1.1.6
- 1.1.7 Apply problem-solving and critical-thinking skills to work-related issues when making decisions and formulating solutions. 1.1.7
- 1.1.8 Identify the correlation between emotions, behavior, and appearance and manage those to establish and maintain professionalism. 1.1.8
- 1.1.9 Give and receive constructive feedback to improve work habits. 1.1.9
- 1.1.11 Recognize different cultural beliefs and practices in the workplace and demonstrate respect for them. 1.1.11
- 1.1.12 Identify healthy lifestyles that reduce the risk of chronic disease, unsafe habits and abusive behavior. 1.1.12

1.2 Leadership and Communications: Process, maintain, evaluate, and disseminate information in a business. Develop leadership and team building to promote collaboration. 1.2

- 1.2.7 Use problem-solving and consensus-building techniques to draw conclusions and determine next steps. 1.2.7

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1.2.11 Write professional correspondence, documents, job applications, and resumés. 1.2.11

1.3 Business Ethics and Law: Analyze how professional, ethical, and legal behavior contributes to continuous improvement in organizational performance and regulatory compliance. 1.3

1.3.2 Follow protocols and practices necessary to maintain a clean, safe, and healthy work environment. 1.3.2

1.3.5 Access and implement safety compliance measures (e.g., quality assurance information, safety data sheets [SDSs], product safety data sheets [PSDSs], United States Environmental Protection Agency [EPA], United States Occupational Safety and Health Administration [OSHA]) that contribute to the continuous improvement of the organization. 1.3.5

1.3.6 Identify deceptive practices (e.g., bait and switch, identity theft, unlawful door-to- door sales, deceptive service estimates, fraudulent misrepresentations) and their overall impact on organizational performance. 1.3.6

1.4 Knowledge Management and Information Technology: Demonstrate current and emerging strategies and technologies used to collect, analyze, record, and share information in business operations. 1.4

1.4.1 Use office equipment to communicate (e.g., phone, radio equipment, fax machine, scanner, public address systems). 1.4.1

1.4.2 Select and use software applications to locate, record, analyze and present information (e.g., word processing, e-mail, spreadsheet, databases, presentation, Internet search engines). 1.4.2

1.4.3 Verify compliance with security rules, regulations and codes (e.g., property, privacy, access, accuracy issues, client and patient record confidentiality) pertaining to technology specific to the industry pathway. 1.4.3

1.4.4 Use system hardware to support software applications. 1.4.4

1.4.5 Use information technology tools to maintain, secure and monitor business records. 1.4.5

1.4.6 Use an electronic database to access and create business and technical information. 1.4.6

1.4.7 Use personal information management and productivity applications to optimize assigned tasks (e.g., lists, calendars, address books). 1.4.7

1.4.8 Use electronic media to communicate and follow network etiquette guidelines. 1.4.8

1.12 Cyber Hygiene: Apply digital information security principles to keep information secure. 1.12

1.12.1 Identify the purpose and practices of Cyber Hygiene. 1.12.1

1.12.2 Differentiate between appropriate and inappropriate information. 1.12.2

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1.12.3 Interpret security policies through job specific training and training updates. 1.12.3

1.12.4 Apply secure password behavior. 1.12.4

1.12.5 Apply physical and virtual situational awareness (e.g., clean desk policies, shoulder surfing, social engineering, tailgating). 1.12.5

IT Fundamentals: Learners apply fundamental principles of IT, including the history of IT and its impact on society, common industry terms, systems theory, information storage and retrieval, database management, and computer hardware, software, and peripheral device configuration and installation. This base of knowledge and skills may be applied across the career field. 2

2.1 Security, Risks, and Safeguards: Describe the need for security and explain security risks and security safeguards. 2.1

2.1.1 Explain the need for confidentiality, integrity, and availability (CIA) of information. 2.1.1

2.1.2 Describe authentication, authorization, and auditing. 2.1.2

2.1.3 Describe multilevel security. 2.1.3

2.1.4 Identify security risks and describe associated safeguards and methodologies (e.g., auditing). 2.1.4

2.1.5 Describe major threats to computer systems (e.g., internal threats, viruses, malware, ransomware, spoofing, hacking, social engineering, phishing, Denial of Service, web application attacks, network-based attacks). 2.1.5

2.1.6 Describe the components of the physical environment (e.g., wiring closets, server rooms) and physical security systems. 2.1.6

2.1.7 Describe the need for security in networking (e.g., firewall, access controls, encryption, demilitarized zone). 2.1.7

2.1.8 Describe the need for security in application development. 2.1.8

2.1.9 Track and catalogue physical assets. 2.1.9

2.1.10 Describe computer forensics, its importance in information security and cybersecurity, and its relevance to law enforcement. 2.1.10

2.1.11 Identify the need for information security and implement best practices for maintaining cyber hygiene (e.g. personal identifiable information, private financial documents, corporate records). 2.1.11

2.1.12 Describe privacy security compliance on systems (e.g., Health Insurance Portability and Accountability Act (HIPAA), Payment Card Industry [PCI], Sarbanes Oxley Act 5 | Introduction to Information Technology | 2025 [SOX], Americans with Disabilities Act [ADA], General Data Protection Regulation [GDPR], European Union Data Protection Regulation [EUDPR]). 2.1.12

2.2 Networking Fundamentals: Apply networking fundamentals to infrastructure systems. 2.2

2.2.1 Differentiate between Local Area Networks (LANs), Wide Area Networks (WANs), Wireless Local Area Networks (WLANs), Near Field Communication (NFC) and other network infrastructure. 2.2.1

2.2.2 Select the basic point-to-point (PTP) and point-to-multipoint (PTMP) network topologies (e.g., star, ring, tree, network, mesh, irregular) and broadband and baseband transmission methods. 2.2.2

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2.2.3 Select network storage techniques (e.g., fiber channel, cloud, Fiber Channel over Ethernet [FCoE], Serial Attached SCSI [SAS], Network File Systems [NFS], Network Attached Storage/Server Message Blocks [NAS/SMB], Redundant Array of Inexpensive Disks [RAID]). 2.2.3

2.2.4 Differentiate between the Internet, intranets, and extranets. 2.2.4

2.2.5 Identify and apply Transmission Control Protocol and Internet Protocol (TCP/IP), Internet Protocol Version 4 (IPv4), Internet Protocol Version 6 (IPv6) applications and services (e.g., rlogin, Simple Mail Transfer Protocol [SMTP], Telecommunications Network [Telnet], File Transfer Protocol [FTP], Domain Name System [DNS], Network File System [NFS], Voice over Internet Protocol [VoIP], Internet Control Message Protocol [ICMP]). 2.2.5

2.2.6 Differentiate between cable types (e.g., fiber optic, twisted pair, coaxial) and interfaces. 2.2.6

2.2.7 Understand and interpret various elements of a fully qualified domain. 2.2.7

2.2.8 Describe the characteristics and uses of networks, network devices, and components (e.g., hubs, switches, routers, firewalls). 2.2.8

2.3 Data Encoding: Explain and describe data encoding basics. 2.3

2.3.1 Identify and explain coding information and representation of characters (e.g., American Standard Code for Information Interchange [ASCII], Extended Binary Coded Decimal Interchange Code [EBCDIC], Unicode). 2.3.1

2.3.2 Convert between numbering systems (e.g., binary, hexadecimal, decimal). 2.3.2

2.5 Maintain Operating Systems: Install and maintain operating systems (OSs). 2.5

2.5.1 Compare Operating Systems for computer hardware (e.g., personal computers, servers, mainframes, operational technology (OT), and mobile devices). 2.5.1

2.5.2 Describe uses and functions of virtual machines. 2.5.2

2.5.3 Identify the properties of open and proprietary systems. 2.5.3

2.5.4 Maintain file structures in an Operating Systems. 2.5.4

2.5.5 Use system utilities to maintain an Operating System. 2.5.5

2.5.6 Describe Operating System interfaces (e.g., command line, Graphic User Interface [GUI]). 2.5.6

2.5.7 Install and test updates and patches to Operating Systems. 2.5.7

2.6 Installation and Configuration: Install and configure hardware and software. 2.6

2.6.1 Comply with license agreements for software and hardware and describe the consequences of noncompliance. 2.6.1

2.6.2 Identify hardware requirements for software applications. 2.6.2

2.6.3 Install and test new software and software upgrades on stand-alone, mobile and networked systems. 2.6.3

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2.6.4 Preserve, convert, or migrate existing data files to a new format. 2.6.4

2.6.5 Determine compatibility (software to software, software to hardware, hardware to hardware). 2.6.5

2.6.6 Install and test hardware peripherals. 2.6.6

2.6.7 Document installation, configuration, and compatibility of hardware and software. 2.6.7

2.7 Applications and Architecture: Explain the fundamentals of delivering information and applications using web architecture. 2.7

2.7.1 Describe methods of securely transmitting data. 2.7.1

2.7.2 Describe ways to present data (e.g., responsive web design, mobile applications, desktop applications, web applications). 2.7.2

2.7.3 Differentiate between a client and a server. 2.7.3

2.7.4 Identify how the use of different browsers and devices effects the function of a webpage (e.g., Americans with Disabilities Act [ADA], text-to-speech, screen reader, mobile vs. desktop). 2.7.4

2.7.5 Explain the relationship between data transmission volumes, bandwidth, and latency. 2.7.5

2.7.6 Describe the characteristics and use of browser plug-ins. 2.7.6

2.7.7 Compare the advantages and disadvantages of running an in-house server or using a service provider. 2.7.7

2.7.8 Describe the difference between static and dynamic sites and the reasons for using each. 2.7.8

2.8 Databases: Describe the fundamentals of databases. 2.8

2.8.1 Identify types of databases (e.g. Relational, Object-oriented, NoSQL, Graph, Data Warehouse, Distributed, Open Source, Cloud, Artificial Intelligence). 2.8.1

2.8.2 Describe the use and purpose of a database and a Database Management System (DBMS) 2.8.2

2.8.3 Compare database structures (e.g., flat file, hierarchical, relational, data lakes, object-oriented, cloud, multi-modal). 2.8.3

2.8.7 Describe how data can be stored in and extracted from a database. 2.8.7

2.8.8 Explain the importance of data integrity and security. 2.8.8

2.10 Equipment: Select, prepare, operate, and maintain equipment. 2.10

2.10.1 Identify hardware platforms, configurations, and support models. 2.10.1

2.10.2 Identify processor, memory, storage, power, and environmental requirements. 2.10.2

2.10.3 Identify architecture requirements. 2.10.3

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2.10.4 Identify software application requirements. 2.10.4

2.10.5 Prepare and operate equipment per project design specifications. 2.10.5

2.10.6 Monitor equipment operation and troubleshoot issues and problems. 2.10.6

2.10.7 Backup, restore, test, archive, and manage data. 2.10.7

2.10.8 Prepare equipment for storage or decommissioning. 2.10.8

2.10.9 Perform routine maintenance per manufacturer specifications. 2.10.9