Ohio CTE

Applications of Artificial Intelligence (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 **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

7 Apply problem-solving and critical-thinking skills to work-related issues when making decisions and formulating solutions. 1.1.7

9 Give and receive constructive feedback to improve work habits. 1.1.9

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

1 Extract relevant, valid information from materials and cite sources of information. 1.2.1

2 Deliver formal and informal presentations. 1.2.2

3 Identify and use verbal, nonverbal, and active listening skills to communicate effectively. 1.2.3

4 Use negotiation and conflict-resolution skills to reach solutions. 1.2.4

5 Communicate information (e.g., directions, ideas, vision, workplace expectations) for an intended audience and purpose. 1.2.5

6 Use proper grammar and expression in all aspects of communication. 1.2.6

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

8 Identify the strengths, weaknesses, and characteristics of leadership styles that influence internal and external workplace relationships. 1.2.8

9 Identify advantages and disadvantages involving digital and/or electronic communications (e.g., common content for large audience, control of tone, speed, cost, lack of non-verbal cues, potential for forwarding information, longevity). 1.2.9

10 Use interpersonal skills to provide group leadership, promote collaboration, and work in a team. 1.2.10

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

12 Use technical writing skills to complete forms and create reports. 1.2.12

13 Identify stakeholders and solicit their opinions. 1.2.13

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14 Use motivational strategies to accomplish goals. 1.2.14

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

3 Use ethical character traits consistent with workplace standards (e.g., honesty, personal integrity, compassion, justice). 1.3.3

4 Identify how federal and state consumer protection laws affect products and services. 1.3.4

7 Identify the labor laws that affect employment and the consequences of noncompliance for both employee and employer (e.g., harassment, labor, employment, employment interview, testing, minor labor laws, Americans with Disabilities Act, Fair Labor Standards Acts, Equal Employment Opportunity Commission [EEOC]). 1.3.7

8 Verify compliance with computer and intellectual property laws and regulations. 1.3.8

9 Identify potential conflicts of interest (e.g., personal gain, project bidding) between personal, organizational and professional ethical standards. 1.3.9

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

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

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

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

5 **Global Environment: Evaluate how beliefs, values, attitudes, and behaviors influence organizational strategies and goals.** 1.5

7 Use intercultural communication skills to exchange ideas and create meaning. 1.5.7

7 **Entrepreneurship/Entrepreneurs: Analyze the environment in which a business operates, and the economic factors and opportunities associated with self-employment.** 1.7

13 Protect intellectual property and knowledge (e.g., copyright, patent, trademark, trade secrets, processes). 1.7.13

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8 **Operations Management: Plan, organize and monitor an organization or department to maximize contribution to organizational goals and objectives.** 1.8

4 Identify alternative actions to take when goals are not met (e.g., changing goals, changing strategies, efficiencies). 1.8.4

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

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

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

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

4 **Emerging Technologies: Identify trending technologies, their fundamental architecture, and their value in the marketplace.** 2.4

1 Identify emerging technologies that are applicable to the marketplace. 2.4.1

2 Describe the fundamental architectures of emerging technologies and how they are integrating into the existing systems of information technology. 2.4.2

3 Research the value of emerging technologies on the marketplace. 2.4.3

4 Describe emerging technologies (e.g., Bring your Own Device [BYOD], Services Virtualization, Mixed Reality [MR], SMART Devices, Additive Manufacturing [3D Printing], Internet of Things, Large Language Models, Machine Learning, and Artificial Intelligence). 2.4.4

6 **Install and Configuration: Install and configure hardware and software.** 2.6

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

8 **Databases: Describe the fundamentals of databases.** 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 Describe the use and purpose of a database and a Database Management System (DBMS). 2.8.2

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

4 Describe the elements of a database (e.g., table, record/row, field, relationships, transactions, schema, normalization, keys). 2.8.4

8 Explain the importance of data integrity and security. 2.8.8

9 Differentiate between a front-end interface and a back-end database. 2.8.9

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Troubleshooting: Select and apply troubleshooting methodologies for problem solving. 2.11

1. Identify the problem. 2.11.1
2. Select troubleshooting methodology (e.g., top down, bottom up, follow the path, spot the differences). 2.11.2
3. Investigate symptoms based on the selected methodology. 2.11.3
4. Gather and analyze data about the problem. 2.11.4
5. Design a solution. 2.11.5
6. Test a solution. 2.11.6
7. Implement a solution. 2.11.7
8. Document the problem and the verified solution. 2.11.8

12 Performance Tests and Acceptance: Develop performance tests and acceptance plans. 2.12

1. Create a written procedure agreed by the stakeholders and project team for determining the acceptability of the project deliverables. 2.12.1
2. Develop a test system that accurately mimics external interfaces. 2.12.2
3. Develop test cases that are realistic, compare with expected performance, and include targeted platforms and device types. 2.12.3
4. Develop, perform, and document usability and testing integration. 2.12.4
5. Make corrections indicated by test results. 2.12.5
6. Seek stakeholder acceptance upon successful completion of the test plan. 2.12.6

14 Artificial Intelligence: Understand and apply prescribed methods of using Artificial Intelligence. 2.14

1. Describe how machine learning and neural networks operate differently than standard decision trees. 2.14.1
2. Analyze how artificial intelligence technology impacts society and the ethical implications of its usage. 2.14.2
3. Write and revise a prompt to generate the desired response from an AI. 2.14.3
4. Evaluate the result of an AI query on a variety of parameters (e.g. validity, relevance, authenticity, potential bias, and hallucinations). 2.14.4
5. Identify and analyze opportunities to apply AI across business, industry and society. 2.14.5
6. Critically analyze scenarios involving AI usage. 2.14.6

15 UX/UI Design: Develop basic skills and knowledge related to the UX/UI design process. 2.15

2. Conduct and analyze research (focus testing, beta testing) with the end user in mind. 2.15.2
3. Design user tasks and evaluate results (e.g. use-case scenarios, tabletop exercises, wireframe testing). 2.15.3

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Information Security: Learners apply principles of information security to implement and maintain security compliance and network security. Learners select components and mechanisms required for a multilayer defense structure and evaluate and minimize security risks to wired and wireless networks and devices. 3

2 **General Security Compliance: Implement and maintain general security compliance.** 3.2

1 Identify and implement data and application security. 3.2.1

Programming and Software Systems: Learners apply principles of computer programming and software development to develop code; build, test, and debug programs; create finished products; and plan, analyze, design, develop, implement, and support software applications. 5

1 **Programming Concepts: Describe programming concepts.** 5.1

1 Describe how computer programs and scripts can be used to solve problems (e.g., desktop, mobile, enterprise, AI, cloud). 5.1.1

2 Explain how algorithms and data structures are used in information processing. 5.1.2

3 Model the solution using both graphic tools (e.g., flowcharts, IPO charts, UML, decision trees, logic tables), pseudocode techniques and artificial intelligence. 5.1.3

6 **Software Development Lifecycle: Apply the software development lifecycle (SDLC).** 5.6

2 Identify constraints and system processing requirements. 5.6.2

5 Identify input and output (I/O) requirements. 5.6.5

6 Design system inputs, outputs, and processes. 5.6.6

7 Document a design using the appropriate tools (e.g., program flowchart, dataflow diagrams, Unified Modeling Language [UML]). 5.6.7

8 Create documentation (e.g., implementation plan, contingency plan, data dictionary, user help). 5.6.8

9 Review the design (e.g., peer walkthrough). 5.6.9

Digital Media: Learners apply principles of digital media to produce interactive media; develop and produce mu... ap... ty...

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1 **Interactive Media: Describe and explain interactive media and interactive media production.** 7.1

4 Identify important historical developments and future trends in interactive media. 7.1.4

Identify the intellectual property rights, responsibilities, and controls related to interactive media. 7.1.7

create 3D models and 2D and 3D animation; and create digital video, audio, and photographs. 7

9 Identify major applications for interactive media (e.g., sales and marketing, interactive advertising, education, online learning, corporate training, corporate communications, news, entertainment). 7.1.9

3 Production: Produce interactive media. 7.3

1 Select the media elements to be used (e.g., sound, video, graphics, text, animation). 7.3.1

Databases: Learners apply principles of designing, creating, and maintaining databases, including data storage, retrieval, modeling, manipulation, and formatting; database access, management, and administration; and database hardware and software issues. 8

2 Design and Creation: Design and create databases. 8.2

3 Implement data integrity, security, encryption and regulatory restrictions (e.g. HIPPA, FERPA). 8.2.3

3 Data Entry and Access: Enter and access data in databases. 8.3

1 Collect and maintain data in the database (e.g., insert, update, delete). 8.3.1

2 Import large data sets into a database (e.g., bulk command, SQL script, CSV file). 8.3.2

5 Queries and Transactions: Perform data queries and database transactions. 8.5

4 Generate and print forms, reports, and results of queries (e.g., calculated fields, functions). 8.5.4

Cybersecurity: Learners apply principles of Cybersecurity to secure and defend information technology systems, selection and implementation of methods and tools to secure physical and digital assets, mange threats, deploy countermeasures, and establish strategies to protect business information using risk and incident management. 9

6 Cybersecurity Law 9.6

1 Adhere to licensing and intellectual property laws (e.g., copyright, trademark, digital-rights management). 9.6.1