

Competency Statements: 11.0201 Computer Programming/Programmer (2024)

Information Technology Fundamentals	Software Development, Industry Solutions, & Software Lifecycle	Safety, Ethics, & Social Responsibility
Demonstrate knowledge of the hardware components and software applications, perform installation and updates to multiple operating systems, proprietary, and open-source software. A1	Identify and analyze customer needs and specifications to develop software solutions. B1	Explain the importance of professional ethics and legal responsibilities. C1
Identify and compare new IT trends and technologies to build an understanding of their potential influence on industry practices. A2	Demonstrate the effective use of tools (frameworks, libraries, integrated development environments (IDEs), etc.) for software development using various programming languages. B2	Apply copyright laws and fair-use guidelines. C2
Utilize solutions (version control, data backup, cloud, etc.) to maintain data integrity. A3	Demonstrate how software applications connect to data solutions (cloud, local). B3	Use design processes and guidelines to produce quality IT products and services. C3
Recognize and analyze potential IT security threats to develop and maintain security requirements. A4	Create proper technical/end-user documentation to ensure software development continuity. B4	Demonstrate diversity, equity, inclusion, and accessibility (DEIA) best practices. C4
Demonstrate knowledge of network integrity protection by incorporating network segregation where appropriate using various network topologies and solutions. A5	Demonstrate knowledge of secure programming and software patching to minimize security risk. B5	Complete work tasks in accordance with personal and jobsite safety rules and regulations (OSHA, ADA compliance, emergency response) to maintain safe and healthful working conditions and environments. C5
Identify and describe quality assurance concepts to develop an understanding of the requirements for IT products and services. A6	Describe the nature and types of business structures to build an understanding of the scope of organizations. B6	Explain employee rights and responsibilities in the workplace. C6
Interpret documentation, author, and analyze logs and data to identify issues. A7	Employ project management skills to oversee software development. B7	Develop professional portfolio related to seeking and applying for employment in IT Career Pathway. C7
Orange Font = PCC Competency Code (A1 = PCC A, Competency Statement 1)	Implement quality control systems and software testing practices to ensure quality products and services. B8	
	Understand and describe software development cycle (Agile, waterfall, CMM, etc.) B9	
	Demonstrate knowledge of device cross-platform development, User Experience (UX), User Interface (UI), and responsive design. B10	

Career Ready Practices*

Refer to the Career Ready Practices tab for **standards** and **performance indicators**

Demonstrate **problem solving skills** consistently and independently

Demonstrate **collaboration skills** consistently and independently

Demonstrate **personal management skills** consistently and independently

Demonstrate **communication skills** consistently and independently

***Required for ALL CTE programs. Not reported in CTEIS. Monitored through CIP Self-review and TRAC review.**

dy Practices are required for ALL Michigan Career and Technical Education programs (reformatted 2022-print one page, landscape)

Problem Solving (PS)	Competency	Collaboration (CL)	Competency	Personal Management (PM)	Competency	Communication (CM)
Demonstrate problem solving skills consistently and independently	CL Competency Statement	Demonstrate collaboration skills consistently and independently	PM Competency Statement	Demonstrate personal management skills consistently and independently	CM Competency Statement	Demonstrate communication skills consistently and independently
Employ valid and reliable research strategies	CL1 Standard	Work productively in teams while using cultural global competence	PM1 Standard	Attend to personal health and financial well-being	CM1 Standard	Communicate clearly and effectively and with reason
Evaluate validity of sources	CL1A	Contribute to every team, whether formal or informal	PM1A	Understand the relationship between personal health, workplace performance and personal well being	CM1A	Communicate thoughts, ideas and action plans with clarity, whether using written, verbal and/or visual methods
Use an informed process to research new information and test new ideas and practices	CL1B	Apply awareness of cultural differences to avoid barriers to productive and positive interaction	PM1B	Act on an understanding to regularly practice healthy diet, exercise, and mental health activities	CM1B	Communicate in the workplace with clarity and purpose to make maximum use of your own and others' time
Discern accepting and using information to make informed decisions	CL1C	Increase the engagement and contribution of all team members	PM1C	Take regular action to contribute to personal financial well-being	CM1C	Write master conventions, word choice and organization, and use effective tone and presentation skills to articulate ideas
Consider the environmental, social and economic impacts of decisions	CL1D	Plan and facilitate effective team meetings (in person and virtual)	PM1D	Recognize that personal financial security provides the peace of mind required to contribute more fully to career success	CM1D	Interact with others; actively listen and speak clearly and with purpose
Understand the interrelated nature of actions and their impact	CL2 Standard	Act as a responsible and contributing citizen and employee	PM2 Standard	Plan education and career paths aligned to personal goals	CM1E	Consider the audience for all communications and prepare accordingly to ensure the desired outcome
Make decisions that positively impact or mitigate negative impact on the environment and others	CL2A	Understand the obligations and responsibilities of being a member of a community and demonstrate this understanding through interactions with others	PM2A	Take personal ownership of educational goals and career goals and regularly act on a plan to attain these goals	CM2 Standard	Use technology to enhance productivity
Be aware of new resources, procedures, technologies, and materials and their impact on the environment, social condition and the organization	CL2B	Be conscientious of the impact of decisions on others and the environment	PM2B	Understand personal interests, preferences, and goals	CM2A	Maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems
Utilize critical thinking to make sense of problems & persevere in solving them	CL2C	Identify the near-term and long-term consequences of actions and seeking to act in ways that contribute to the betterment of the team, family, community, and workplace	PM2C	Display perspective regarding the career pathways available and the time, effort, experience, and other requirements to pursue each, including the path of entrepreneurship	CM2B	Flexible and adaptive in acquiring and using new technology
Recognize problems in the workplace, understanding the nature of the problem and devising effective plans to solve the problem	CL2D	Be reliable and consistent in going beyond the minimum expectations and participating in activities that serve the greater good	PM2D	Recognize the value of each step in the educational and experiential process	CM2C	Proficient with ubiquitous technology applications
Recognize problems as they occur and take action to quickly address the problem	CL3 Standard	Model integrity, ethical leadership and effective management	PM2E	Recognize that nearly all career paths require ongoing education and experience	CM2D	Understand and take actions to prevent or mitigate inherent risks of technology applications both personal and organizational
Investigate the root cause of the problem prior to introducing solutions	CL3A	Consistently act in ways that align to personal and community-held ideals and principles	PM2F	Seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals		
Carefully consider the options to solve the problem	CL3B	Employ strategies to positively influence others in the workplace				
Follow through with the agreed upon solution to ensure the problem is solved, either by your own actions or that of others	CL3C	Understand integrity and act on this understanding in every decision				
Demonstrate creativity and innovation	CL3D	Use a variety of means to positively impact the direction and actions of a team or organization				
Regularly think of ideas that solve problems in new and different ways	CL3E	Apply insights into human behavior to change others' actions, attitudes and/or beliefs				
Contribute ideas in a useful and productive manner to improve the organization	CL3F	Recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture				
Consider unconventional ideas and suggestions as solutions to issues, tasks or problems and distinguish which ideas will add greatest value						
Seek new methods, practices and ideas from a variety of sources and seek to apply those ideas to the workplace						
Take action on ideas and understand how to bring innovation to an organization						
Apply appropriate academic and technical skills						
Use knowledge and skills to be productive						
Make connections between abstract concepts and real-world applications						
Make correct insights and apply academic skills in the workplace as appropriate						

COLOR KEY

Problem Solving (PS) Standards PS1, PS2, PS3, PS4, PS5
PS Performance Indicators: PS1A-1C, PS2A-2C, PS3A-3E, PS4A-4E, PS5A-5C
Collaboration (CL) Standards CL1, CL2, CL3
CL Performance Indicators: CL1A-1E, CL2A-2D, CL3A-3E
Personal Management (PM) Standards PM1, PM2
PM Performance Indicators: PM1A-1E, and PM2A-2E
Communication (CM) Standards CM1, CM2
CM Performance Indicators: CM1A-1E, CM2A-2D

Source:

<https://careertech.org/career-ready-practices>