

Foundations of Computer Programming (MS-CS-FCP)

Demonstrate employability skills required by business and industry and explore, research, and present careers in information technology. **MS-CS-FCP.1**

- 1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.** **MS-CS-FCP.1.1**
- 2 Demonstrate an understanding of collaborative interactions in the digital world.** **MS-CS-FCP.1.2**
- 3 Model work-readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.** **MS-CS-FCP.1.3**
- 4 Exhibit critical thinking and problem-solving skills to locate, analyze, and apply information in career planning and employment situations.** **MS-CS-FCP.1.4**
- 5 Present a professional image through appearance, behavior and language.** **MS-CS-FCP.1.5**
- 6 Investigate educational requirements, job responsibilities, employment trends, and opportunities within information technology career pathways using credible sources.** **MS-CS-FCP.1.6**

Explore and explain the basic components of computers and their relationships to programming. **MS-CS-FCP.2**

- 1 Identify the basic components of the computer (processor, operating system, memory, storage, ethernet ports) by disassembling and reassembling a demonstration model personal computer (may be done ‘virtually’ online if demo model is not available).** **MS-CS-FCP.2.1**
- 2 Demonstrate an understanding of key functional components (input/output devices, software applications, wi-fi and/or Ethernet, and IP addresses).** **MS-CS-FCP.2.2**
- 3 Demonstrate an understanding of the fundamental concepts for how computers process programming commands (hex, binary language, sequence of commands, conditional structures, looping structures).** **MS-CS-FCP.2.3**

Utilize computational thinking to solve problems. **MS-CS-FCP.3**

- 1 Make observations and organize the concepts of modularity, including functions and methods, as it relates to programming code reusability and cloud computing in the software industry.** **MS-CS-FCP.3.1**

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- 2** Develop a working vocabulary of computational thinking including sequences, algorithms, binary, pattern matching, decomposition, abstraction, parallelization, data, automation, data collection, data analysis, Boolean, integer, branches (if...then...else), and iteration {loops (For, While)}. MS-CS-FCP.3.2
 - 3** Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems. MS-CS-FCP.3.3
 - 4** Develop an algorithm to decompose a problem of a daily task. MS-CS-FCP.3.4
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Design, develop, debug and implement computer programs. MS-CS-FCP.4

- 1** Develop a working vocabulary of programming including flowcharting and/or storyboarding, coding, debugging, user interfaces, usability, variables, lists, loops, conditionals, programming language, and events. MS-CS-FCP.4.1
 - 2** Utilize the design process to brainstorm, implement, test, and revise an idea. MS-CS-FCP.4.2
 - 3** Cite evidence on how computers represent data and media (sounds, images, video, etc.). MS-CS-FCP.4.3
 - 4** Design a user interface and test with other users using a paper prototype. MS-CS-FCP.4.4
 - 5** Implement a simple algorithm in a computer program. MS-CS-FCP.4.5
 - 6** Develop an event driven program. MS-CS-FCP.4.6
 - 7** Create a program that accepts user and/or sensor input and stores the result in a variable. MS-CS-FCP.4.7
 - 8** Create a computer program that implements a loop. MS-CS-FCP.4.8
 - 9** Develop a program that makes a decision based on data or user input. MS-CS-FCP.4.9
 - 10** Debug a program with an error. MS-CS-FCP.4.10
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Explore the relationship between computer hardware and software. MS-CS-FCP.5

- 1** Develop a working vocabulary of embedded computing including digital, analog, events, microcontrollers, sensors, light emitting diodes (LED), switches, servos, cloud computing, and internet of things. MS-CS-FCP.5.1
- 2** Investigate how software interacts with hardware in the boot process. MS-CS-FCP.5.2
- 3** Analyze and explain how computers communicate information with simple hardware inputs and outputs. MS-CS-FCP.5.3
- 4** Create a product that analyzes how simple computer hardware can be used to develop innovative new products that interact with the physical world. MS-CS-

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- 5 Design a computer program that senses something in the real world and changes an output based on the input.** MS-CS-FCP.5.5
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Create digital artifacts to address a current issue requiring resolution. MS-CS-FCP.6

- 1 Summarize ethical, privacy, and legal issues of a digital world using current case studies.** MS-CS-FCP.6.1
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- 2 Collaborate as a team to develop an artifact that represents multiple perspectives regarding a global crisis.** MS-CS-FCP.6.2
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- 3 Analyze and explain the functionality and suitability (or appropriateness) of a computational artifact.** MS-CS-FCP.6.3
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- 4 Develop a program for creative expression or to satisfy personal curiosity which may have visual, audible, and/or tactile results.** MS-CS-FCP.6.4
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- 5 Develop a program specifically with the goal of solving a problem, creating new knowledge, or helping people, organizations, or society.** MS-CS-FCP.6.5