

**Information Technology Career Cluster**  
**Foundations of Computer Programming (MS-CS-FCP)**  
**Course Number: 11.01200**

**Course Description:** This course will provide an exploratory foundation in computer programming. It is designed to be taught in a 9-week rotation in 45-minute daily classes. Standards should be taught in the order presented with the exception of Standard 1 being an embedded standard with ongoing learning regarding employability and career opportunities. Through integrated instructional activities, students will have opportunities to apply employability skills and to research possible career options in the information technology area. They will also complete many hands-on activities to build a strong foundation in computer coding. Capstone projects should be incorporated at the completion of all standards as time allows. Students who successfully complete this course will be prepared for the following pathways upon entering high school: Internet of Things, Programming, and Computer Science. This course may be taught in 6th, 7th, or 8th grade.

Requirements for teaching this and other computer science courses: This course should be taught in a lab setting with a 1:1 ratio of student to personal computer. Additional devices, such as tablets, robots, Raspberry pi computers, and drones will enhance the program and can be shared in groups of 2-3 students. All devices should be current technology with strong connectivity capabilities. To further enhance student learning, the lab should contain at least one personal computer that students can disassemble and reassemble to learn the working parts within the computer.

**Course Standard 1**

**MS-CS-FCP-1**

**Demonstrate employability skills required by business and industry.**

The following elements should be integrated throughout the content of this course.

1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities.

<b>Person-to-Person Etiquette</b>	<b>Telephone and Email Etiquette</b>	<b>Communicating at Work</b>	<b>Listening</b>
Interacting with Your Boss	Telephone Conversations	Improving Communication Skills	Reasons, Benefits, and Barriers
Interacting with Subordinates	Barriers to Phone conversations	Effective Oral Communication	Listening Strategies
Interacting with Co-workers	Making and Returning Calls	Effective Written Communication	Ways We Filter What We Hear
		Effective Nonverbal Skills	Developing a Listening Attitude
		Effective Word Use	Show You Are Listening
		Giving and Receiving Feedback	Asking Questions
			Obtaining Feedback
			Getting Others to Listen

<b>Nonverbal Communication</b>	<b>Written Communication</b>	<b>Speaking</b>	<b>Applications and Effective Résumés</b>
Communicating Nonverbally	Writing Documents	Using Language Carefully	Completing a Job Application
Reading Body Language and mixed Messages		One-on-One Conversations	Writing a Cover Letter
Matching Verbal and Nonverbal communication		Small Group Communication	Things to Include in a Résumé
Improving Nonverbal Indicators		Large Group Communication	Terms to Use in a Résumé
Nonverbal Feedback		Making Speeches	Organizing Your Résumé
Showing Confidence Nonverbally		Answering Questions	Writing an Electronic Résumé
Showing Assertiveness		Visual and Media Aids	
		Errors in Presentation	

1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods.

<b>Teamwork and Problem Solving</b>	<b>Meeting Etiquette</b>
Thinking Creatively	Preparation and Participation in Meetings
Taking Risks	Conducting Two-Person or Large Group Meetings
Building Team Communication	Inviting and Introducing Speakers
	Preparing Visual Aids

1.3 Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations.

a. Investigate educational requirements, job responsibilities, employment trends, and opportunities within the national career clusters using credible sources.

<b>Problem Solving</b>	<b>Customer Service</b>	<b>The Application Process</b>	<b>Interviewing Skills</b>	<b>Finding the Right Job</b>
Transferable Job Skills	Gaining Trust and Interacting with Customers	Providing Information, Accuracy and Double Checking	Preparing for an Interview	Locating Jobs and Networking
Becoming a Problem Solver	Learning and Giving Customers What They Want	Online Application Process	Questions to Ask in an Interview	Job Shopping Online
Identifying a Problem	Keeping Customers Coming Back	Following Up After Submitting an Application	Things to Include in a Career Portfolio	Job Search Websites
Becoming a Critical Thinker	Seeing the Customer's Point	Effective Résumés:	Traits Employers are Seeking	Staying Motivated to Search
	Selling Yourself and the Company	Matching Your Talents to a Job	Considerations Before Taking a Job	
		When a Résumé Should be Used		

1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity.

<b>Workplace Ethics</b>	<b>Personal Characteristics</b>	<b>Employer Expectations</b>	<b>Business Etiquette</b>	<b>Communicating at Work</b>
Demonstrating Good Work Ethic	Demonstrating a Good Attitude	Behaviors Employers Expect	Language and Behavior	Handling Anger
Behaving Appropriately	Gaining and Showing Respect	Objectionable Behaviors	Keeping Information Confidential	Dealing with Difficult Coworkers
Maintaining Honesty	Demonstrating Responsibility	Establishing Credibility	Avoiding Gossip	Dealing with a Difficult Boss
Playing Fair	Showing Dependability	Demonstrating Your Skills	Appropriate Work Email	Dealing with Difficult Customers
Using Ethical Language	Being Courteous	Building Work Relationships	Cell Phone Etiquette	Dealing with Conflict
Showing Responsibility	Gaining Coworkers' Trust		Appropriate Work Texting	
Reducing Harassment	Persevering		Understanding Copyright	
Respecting Diversity	Handling Criticism		Social Networking	
Making Truthfulness a Habit	Showing Professionalism			

1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply teamwork skills.

<b>Expected Work Traits</b>	<b>Teamwork</b>	<b>Time Management</b>
Demonstrating Responsibility	Teamwork Skills	Managing Time
Dealing with Information Overload	Reasons Companies Use Teams	Putting First Things First
Transferable Job Skills	Decisions Teams Make	Juggling Many Priorities
Managing Change	Team Responsibilities	Overcoming Procrastination
Adopting a New Technology	Problems That Affect Teams	Organizing Workspace and Tasks
Use Technology Ethically & Efficiently	Expressing Yourself on a Team	Staying Organized
Interact Appropriately in a Digital World	Giving and Receiving Constructive Criticism	Finding More Time
		Managing Projects
		Prioritizing Personal and Work Life

1.6 Present a professional image through appearance, behavior and language.

<b>On-the-Job Etiquette</b>	<b>Person-to-Person Etiquette</b>	<b>Communication Etiquette</b>	<b>Presenting Yourself</b>
Using Professional Manners	Meeting Business Acquaintances	Creating a Good Impression	Looking Professional
Introducing People	Meeting People for the First Time	Keeping Phone Calls Professional	Dressing for Success
Appropriate Dress	Showing Politeness	Proper Use of Work Email	Showing a Professional Attitude
Behavior at Conventions		Proper Use of Cell Phone	Using Good Posture
Working in a Cubicle		Proper Use in Texting	Presenting Yourself to Associates
			Accepting Criticism
			Demonstrating Leadership

## Course Standard 2

### MS-CS-FCP-2

**Explore and explain the basic components of computers and their relationships to programming.**

- 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).
- 2.2 Demonstrate an understanding of key functional components (input/output devices, software applications, wi-fi and/or Ethernet, and IP addresses).
- 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).

## Course Standard 3

### MS-CS-FCP-3

**Utilize computational thinking to solve problems.**

- 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.
- 3.2 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)}.
- 3.3 Analyze the problem-solving process, the input-process-output-storage model of a computer, and how computers help humans solve problems.
- 3.4 Develop an algorithm to decompose a problem of a daily task.

## Course Standard 4

### MS-CS-FCP-4

**Design, develop, debug and implement computer programs.**

- 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.
- 4.2 Utilize the design process to brainstorm, implement, test, and revise an idea.
- 4.3 Cite evidence on how computers represent data and media (sounds, images, video, etc.).
- 4.4 Design a user interface and test with other users using a paper prototype.
- 4.5 Implement a simple algorithm in a computer program.
- 4.6 Develop an event driven program.
- 4.7 Create a program that accepts user and/or sensor input and stores the result in a variable.
- 4.8 Create a computer program that implements a loop.
- 4.9 Develop a program that makes a decision based on data or user input.
- 4.10 Debug a program with an error.

## Course Standard 5

### MS-CS-FCP-5

#### Explore the relationship between computer hardware and software.

- 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.
- 5.2 Investigate how software interacts with hardware in the boot process.
- 5.3 Analyze and explain how computers communicate information with simple hardware inputs and outputs.
- 5.4 Create a product that analyzes how simple computer hardware can be used to develop innovative new products that interact with the physical world.
- 5.5 Design a computer program that senses something in the real world and changes an output based on the input.

## Course Standard 6

### MS-CS-FCP-6

#### Create digital artifacts to address a current issue requiring resolution.

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

## Course Standard 7

### MS-BMF-FBM-7

#### Examine how related student organizations are integral parts of career and technology education courses through leadership development, school and community service projects, and competitive events.

- 7.1 Research the history of Future Business Leaders of America (FBLA).
- 7.2 Discuss the mission, purpose, motto, colors, official dress, and other distinguishing characteristics of FBLA.
- 7.3 Explain how participation in FBLA can promote lifelong responsibility for community service, professional growth, and development.
- 7.4 Create a personal leadership plan to participate in programs, conferences, community service, and competitive events on the local, state, and national level that align with the competencies, skills, and knowledge of this course.