

A Comparison of Computer Course Offerings from Michigan Virtual (SY 2018-2019)

Course & (Content Provider)	Primary Focus	Course Objectives	Technical Requirements or Additional Costs	Other Notes
Foundations of Programming A (Florida Virtual School (Global))	Introduction to concepts, techniques and processes related to computer programming, utilizing the Python programming language	<ul style="list-style-type: none"> *Intro to programming; *Intro to Python; *String input/output; *Computing numerical data; *Loops and logic 	No additional costs. No software downloads. Python operations will be performed within the learning management system interface.	This should be the default choice for students interested in an introduction to computer programming.
Foundations of Programming B (Florida Virtual School (Global))	Further study of additional aspects of general computer programming techniques and processes, in addition to an	<ul style="list-style-type: none"> *Conditional statements; *Codes and ASCII; *Object-oriented programming; *Testing, ethics, and security; *Coding Careers 	No additional costs. No software downloads. Python operations will be performed within the learning management system interface.	

	introduction to quality control, ethical and security issues, and career options			
Basic Web Design: HTML & CSS (Accelerate Education)	How to design a beautiful and functional website using Hypertext Markup Language (HTML5) and Cascading Style Sheets (CSS3).	<ul style="list-style-type: none"> *HTML webpage elements; *Writing basic HTML code; *Effective web design principles; *Using text formatting, color, graphics, images, and multimedia in web design; *Applying CSS3 to format web page elements; *Applying accessibility standards; *Plan, design, and publish a website 	Personal computer or laptop required; tablets are not sufficient. HTML Text Editor: TextEdit, Notepad, or Text Image Editing Software: Pixlr or GIMP Web-hosting and basic in-browsing FTP: Neocities	New release this year!
Advanced Web Design: JavaScript (Accelerate Education)	Learn the third programming language used by web developers: JavaScript.	<ul style="list-style-type: none"> *Variable naming rules and JavaScript data types; *Use expressions, operators, objects, arrays, functions, and methods; *Document Object Model; *Use Get Input and Output commands; *Manage webpage styles and events; *Script web tables and forms 	Personal computer or laptop required; tablets are not sufficient. HTML Text Editor: TextEdit, Notepad, or Text Image Editing Software: Pixlr or GIMP Web-hosting and basic in-browsing FTP: Neocities	New release this year! Prerequisite: Completion of Basic Web Design: HTML & CSS or an equivalent course. Students should have a working knowledge of HTML and CSS before taking this course. It is also recommended that students have completed an introductory programming course (e.g., Foundations of Programming).

<p>Digital Information Technology A</p> <p>(Florida Virtual School (Global))</p>	<p>Examine IT careers in a variety of fields. Explore Microsoft Office applications.</p>	<ul style="list-style-type: none"> *Computer hardware and software; *Computer file management; *Basic computer maintenance; *Computer networking basics; *Ethics in IT; *Microsoft Word online (layout, design theory, proofing and editing); *Microsoft Excel online (spreadsheet formatting, formulas, functions; data display; and data warehousing) 	<p>Students are required to create an account to use Microsoft Online (Office.com). Access is free. Further instructions are provided within the course materials.</p>	<p>New release this year!</p>
<p>Digital Information Technology B</p> <p>(Florida Virtual School (Global))</p>	<p>Hone skills in using the web. Continue a study of Microsoft Office applications. Explore an introduction to web design elements. Plan a future in the IT workforce.</p>	<ul style="list-style-type: none"> *Describe the origin of the Internet; *Identify components of a GUI; *Use the Internet for effective research; *Build powerful presentations with Microsoft PowerPoint online; *Identify basics of web design and employ quality design standards for images published online; *Create a portfolio of your 	<p>Students are required to create an account to use Microsoft Online (Office.com). Access is free. Further instructions are provided within the course materials.</p>	<p>New release this year!</p>

		IT-related skills and use of IT tools		
Social Media (Florida Virtual School (Global))	Informed, effective and safe usage of online social networking tools	*Examine how social media has evolved; *Understand how evaluate authenticity and truth; *Learn how to protect your digital footprint; *Discover your voice as a an effective online writer; *Crowdsource for information gathering	None	None
Advanced Programming: Game Design & Simulation (Michigan Virtual)	Understand game genres and modes of play. Engage in virtual and non-player character development and storytelling, concept drawing, 2D/3D rigging and animation to design and develop a game.	*Understand phases, roles, and elements of the game design process and tools; *Create game objects using animation techniques in 2D & 3D environments; *Use spawning, cameras, collisions, and user interface elements of game play; *Collaborate as a small team to script, design, and build a basic game from scratch	This course requires students to use a game design engine called Unity. We will use a free version, called Unity3D.com. System Requirements for Unity version 2017.4.1 include (1) one of the following Operating Systems (OS): Windows 7 SP1+, 8, or 10; Mac OS X 10.9+; (2) a computing device with the following GPU specifications: Graphics card with DX9 (shader model 3.0) or DX11 with feature level 9.3 capabilities. (3) 2.8 to 4.0 GB of free storage space on the Windows or Mac device to permit the download of software. Note: The 1.2GB differential in storage space requirements is based on whether the student will also need to	New release this year! Prerequisite: Completion of at least two semesters (equivalent of one full year) of prior study in computer programming (e.g., Foundations of Programming A & B; Basic & Advanced Web Design; and/or AP Computer Science A (Java) Sem 1 & Sem 2).

			<p>download Visual Studio Community 2017 or will be using an alternative IDE code editing environment.</p> <p>Students must be able to download the free version of Unity Personal (Unity 2017.4.1f1) from Unity3D.com as well as Microsoft Visual Studio Community 2017 for Windows or Mac. Visual Studio is a free integrated development environment (IDE) for computer programming, code editing, and debugging in any of several code languages--C#, Visual Basic, F#, C++, HTML, JavaScript, TypeScript, or Python. Download of Visual Studio requires creation of a free account with Microsoft Visual Studio, using a valid email address. Students choosing not to download Visual Studio must have access to an alternative IDE code editor.</p>	
<p>AP Computer Science Principles (Sem 1) (Michigan Virtual)</p>	<p>Introduction to computer science, focusing on computational thinking, data use and analysis, solving problems</p>	<p>*Computer concepts and the impact of computing on society; *Use algorithmic and information management principles to create computational artifacts;</p>	<p>None</p>	<p>New release this year!</p>

	individually and collaboratively.	<ul style="list-style-type: none"> *Explain how data, abstractions and modeling are used in computing; *Evaluate proposed solutions to a problem, and troubleshoot and correct errors; *Collaborate with other students in solving a computational problem and producing a computational artifact 		
AP Computer Science Principles (Sem 2) (Michigan Virtual)	TBA	TBA	TBA	New release scheduled to launch in Spring 2019!
AP Computer Science A (Sem 1) (Florida Virtual School (Global))	This is the first of two segments of curriculum aligned to the College Board expectations to prepare students for the Advanced Placement Exam in Computer Science A (Java).	Applications of computing within the context of programming methodology, algorithms, data structures, and use of the Java computer language. <ul style="list-style-type: none"> *Arithmetic Expressions and Variables; *Strings; *If Statements; *Iterative Control Structures; *Arrays & Array Lists; *Methods & Objects 	The Java computer language which is a free download for either a Macintosh or a Windows platform. <p>IMACS software includes students' eTextbook and labs for the eIMACS online edition of Maria Litvin and Gary Litvin, Be Prepared for the AP Computer Science Exam in Java, 6th edition, Andover, MA: Skylight Publishing, 2014, at a cost of \$24.95.</p>	This course is the equivalent of an introductory level college course within its content area. <p>Michigan Virtual does not administer the AP exam. Students should arrange with their school to register with the College Board to attend a locally administered AP Exam session.</p>

<p>AP Computer Science A (Sem 2) (Florida Virtual School (Global))</p>	<p>This is the second of two segments of curriculum aligned to the College Board expectations to prepare students for the Advanced Placement Exam in Computer Science A (Java).</p>	<p>Applications of computing within the context of programming methodology, algorithms, data structures, and use of the Java computer language.</p> <ul style="list-style-type: none"> *Recursion; *Inheritance and Polymorphism; *Abstractions; *Standard Algorithms; *Sorting; *Searching; *Program Analysis; *Review for the AP exam 	<p>The Java computer language which is a free download for either a Macintosh or a Windows platform.</p> <p>IMACS software includes students' eTextbook and labs for the eIMACS online edition of Maria Litvin and Gary Litvin, Be Prepared for the AP Computer Science Exam in Java, 6th edition, Andover, MA: Skylight Publishing, 2014, at a cost of \$24.95. Note: Students who purchased access to this eTextbook during semester 1 will still have access at no additional cost during semester 2, so long as both semesters were taken in a single school year.</p>	<p>This course is the equivalent of an introductory level college course within its content area.</p> <p>Michigan Virtual will purchase an additional IMACS software module aimed at studying for the College Board's AP exam – "Be Prepared for the AP Computer Science Exam in Java" – for all semester 2 students still enrolled after the final drop date at no additional cost to students or enrolling schools.</p> <p>Michigan Virtual does not administer the AP exam. Students should arrange with their school to register with the College Board to attend a locally administered AP Exam session.</p>
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Recommended Career Pathway Progressions of Study:

Information Technology: Documentation & Web Design Focus	Information Technology: Computer Programming Focus
Year 1: Digital Information Technology A & B Year 2: Basic Web Design & Advanced Web Design Year 3: AP Computer Science Principles (Sem 1 & Sem 2) Year 4: Social Media & Composition (Beginning OR Advanced)	Year 1: Foundations of Programming A & B Year 2: Basic Web Design & Advanced Web Design Year 3: AP Computer Science A (Java) (Sem 1 & Sem 2) Year 4: Advanced Programming: Game Design & Simulation