Course Title: Computer and Information Technology	**Length of Course:** 9 weeks
Grade Level(s): 7	**Periods Per Cycle:** 6
Units of Credit: N/A	**Length of Period:** 47 minutes
Classification: Required	**Total Instructional Time:** 37 hours

Course Description

The driving emphasis of this course is to provide students with a continuing skill set for 21st century learning, particularly in terms of: having a clear understanding of the principles and practices of computer science; advocating and practicing safe, legal, and responsible use of information and technology; using technology that supports collaboration, learning, and productivity; selecting and using applications effectively and productively; and transferring current knowledge to learning of new technologies. The students will develop skills in systems analysis and design, coding and programming, and various design principles.

Instructional Strategies, Learning Practices, Activities, and Experiences

eLearning	Bell Ringers	Gamification
Blended and Synchronous Learning	Closure	Cooperative Learning (flexible groups)
Project-Based Learning	Interaction Sequence	Video Tutorials and Demonstrations
Simulations and Game-Based Learning	Blogging	Advanced Problem Solving

Assessments

Online Asynchronous Discussion	Interaction Sequence	Reflective Writing
Closure	Skill checklists	Multimedia Presentations/Projects
Project-Based Learning	Observation	Screencasting and Screenshots
Rubrics	Interview/Dialog	

Materials/Resources

Computers   Headphones/Microphones   Canva
NetOp   Adobe Creative Suite   Google Apps
School-Issued iPads   Code.org   Sketchup
Cameras   Gamestar Mechanic   3D Printers

Safe and Responsible Publishing, Netiquette and Digital Citizenship	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
Edmodo and Social/Professional Networking The students will: • Join Edmodo. • Set up a personal profile. • Join a course group. Student Resource Officer Presentation The students will participate in an interactive presentation with the student resource officer, focusing on: • Digital Citizenship • Netiquette • Privacy/Identity Protection • Safe and legal use of networks and devices Acceptable Use Policy (AUP) Review • Students will review AUP. • Students will review Bring Your Own Device (BYOD) Policies.	The students will: • Familiarize themselves with the workings of copyright and how they apply to what they post online. • Know how to protect their personal information online and avoid exposing themselves or their identity to danger. • Observe social norms established in online environments for the good of the community in their digital communications (Netiquette). • Participate regularly in an online social environment for the purpose of professional and academic growth. • Advocate and practice safe, legal, and responsible use of information and technology, which includes social media and mobile communications. • Use online networks to assist classmates and demonstrate appropriate and professional communications (LEADERSHIP AND RESPONSIBILITY). **PA Academic Standards** **15.4.8.A:** ~ Analyze the influence of emerging technologies on daily life. **15.4.8.B:** ~Interpret and apply appropriate social, legal, ethical, and safe behaviors of digital citizenship. **CSTA K-12 CS Standards** (endorsed by PA but not yet PA Academic) **2-NI-05 6-8** ~ Explain how physical and digital security measures protect electronic information. **2-IC-23 6-8** ~ Describe tradeoffs between allowing information to be public and keeping information private and secure. **ISTE NETS (International Society for Technology – National Education Technology Standards)** **NETS 2.A** ~ Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world. **NETS 2.B** ~ Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices. **NETS 2.C** ~ Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property. **NETS 2.D** ~ Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online. **NETS 6.A** ~ Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Systems Thinking and User-Centered Design	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
The students will begin to explore "Systems-Thinking" and "User-Centered Design." Gamestar Mechanic To develop even a simple game, the students must act as *sociotechnical engineer*, thinking about how people will interact with a system and how said systems shape both competitive and collaborative social interaction. • Systems-Thinking: The students will design and analyze dynamic systems, a characteristic activity in both the media and in science today. • Interdisciplinary Thinking: The students will solve problems that require them to seek out and synthesize knowledge from different domains. They become intelligent and resourceful as they learn how to find and use information in meaningful ways. • User-Centered Design: The students will act as sociotechnical engineers, thinking about how people interact with systems and how systems shape both competitive and collaborative social interaction. • Specialist Language: The students will learn to use complex technical, linguistic, and symbolic elements from a variety of domains, at a variety of different levels, for a variety of different purposes. • Meta-Level Reflection: The students learn to explicate and defend their ideas, describe issues and interactions at a meta-level, create and test hypotheses, and reflect on the impact of their solutions on others.	The students will: • Use observations of examples of effective and ineffective design to develop strategies to improve communication, sustainability, and usability. • Design and analyze dynamic systems, a characteristic activity in both the media and in science today. • Solve problems that require them to seek out and synthesize knowledge from different domains as they find and apply information in meaningful ways. • Act as a sociotechnical engineer, thinking about how people interact with systems and how systems shape both competitive and collaborative social interaction as they develop an end-user experience. • Explicate and defend their ideas, describe issues and interactions at a meta-level, create and test hypotheses, and reflect on the impact of their solutions on others in developing and deploying an end-user experience. **PA Academic Standards** 15.4.8.G: ~ Create an advanced digital project using appropriate software/application for an authentic task. 15.4.8.K:~ Create a multimedia project using student-created digital media. **CSTA K-12 CS Standards** (endorsed by PA but not yet PA Academic) 2-CS-01 6-8 ~ Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices. 2-CS-03 6-8 ~ Systematically identify and fix problems with computing devices and their components. 2-AP-13 6-8 ~ Decompose problems and sub problems into parts to facilitate the design, implementation, and review of programs. **ISTE NETS** **NETS 4.A** ~ Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. **NETS 4.C** ~ Students develop, test and refine prototypes as part of a cyclical design process. **NETS 5.A** ~ Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions. **NETS 5.C** ~ Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

Programming Concepts	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
The students will focus on coding and programming: Code.org As students create programs, they learn core computational concepts such as iteration and conditionals. They also gain an understanding of important mathematical concepts such as coordinates, variables, and random numbers. Computational Concepts • Sequence - identifying a series of steps for a task • Loops - running the same sequence multiple times • Parallelism - making things happen at the same time • Events - one thing causing another thing to happen • Conditionals - making decisions based on conditions • Operators - support for mathematical and logical • Expressions – data storing, retrieving, and updating values Computational Practices • Testing and debugging - making sure that things work – and finding and fixing mistakes • Reusing and remixing - making something by building on what others, or you, have done • Abstracting and modularizing - building something large by putting together collections of smaller parts	The students will: • Design and analyze dynamic systems, a characteristic activity in both the media and in science today, with considerations of how end-users interact with said systems. • Explicate and defend their ideas, describe issues and interactions at a meta-level, create and test hypotheses, and reflect on the impact of their solutions on others. • Develop an understanding of programming and computational concepts. • Develop fluency with computational concepts (i.e. sequence, loops, events) and practices (i.e. iterative and incremental development, testing and debugging, reusing and remixing). • PA Academic Standards **15.4.8.G:** ~ Create an advanced digital project using appropriate software/application for an authentic task. **15.4.8.H:** ~ Explain the differences between a scripting language and a coding language. **15.4.8.I:** ~ Solve a problem with an algorithm. **15.4.8.M:** ~ Explore and describe how emerging technologies are used across different career paths. CSTA K-12 CS Standards (endorsed by PA but not yet PA Academic) **2-AP-11 6-8** ~ Create clearly named variables that represent different data types and perform operations on their values. **2-AP-12 6-8** ~ Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. **2-AP-13 6-8** ~ Decompose problems and sub problems into parts to facilitate the design, implementation, and review of programs. **2-AP-14 6-8** ~ Create procedures with parameters to organize code and make it easier to reuse. ISTE NETS **NETS 5.B** ~ Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making. **NETS 5.D** ~ Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Visual Design for Effective Communication	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
People don't communicate solely in writing anymore. Now we communicate with design. Design is visual! Designers, through training and experience, develop a different lens through which to see the world. They move through spaces, environments, and systems, making observations and developing insights about what works well and what doesn't. They then use those observations and insights to create innovative solutions for everyday problems. Design Skills - Visual communication techniques - Typography and font selection - Color and media Red-Green-Blue (RGB), Cyan, Magenta, Yellow Key (CMYK) Business and Communication Skills - Effective use of presentation software - Clear written communication conventions	The students will: - Use the relationship between color, typography, layout, and tone to design for a specific audience and purpose. - Employ good typography and color theory to design for impact and readability. - Create clarity by reducing colors, removing clutter, using fonts and styles sparingly. - Align visual and text elements to enforce order, space elements evenly to create rhythm, use vertical and horizontal alignment for perfect positioning, align text with purpose, and help content breathe by creating a margin. PA Academic Standards **15.4.8.G:** ~ Create an advanced digital project using appropriate software/application for an authentic task. **15.4.8.K:** ~ Create a multimedia project using student-created digital media. ISTE NETS **NETS 6.B** ~ Students create original works or responsibly repurpose or remix digital resources into new creations. **NETS 6.C** ~ Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations. **NETS 6.D** ~ Students publish or present content that customizes the message and medium for their intended audiences.

Design Thinking, Applications, and Productivity	
CONTENT/KEY CONCEPTS	**OBJECTIVES/STANDARDS**
Microsoft Office is a great tool, but there is so much more. There are myriad applications available to students, web-based and local. There are also a host of emerging input technologies and peripheral devices beyond the standard computing setup. The students will learn what categories of applications are appropriate for any given task and how to use said applications in tandem to produce results and solve problems. Application Skills • Image handling and editing • Audio editing • Video editing • Illustration • Publishing • Resource management • Interactive and animation Device Skills • Touch screen • Mobile • Cloud management • 3D printing	The students will: • Apply existing knowledge to create original works to complete a project. • Determine and use the appropriate technology tool(s) for the task at hand in a manner that allows seamless transfer of created objects and documents to flow easily between the selected tools without outside intervention. • Use observations of examples of effective and ineffective design to develop strategies to improve communication, sustainability, and usability. **PA Academic Standards** **15.4.8.G:** ~ Create an advanced digital project using appropriate software/application for an authentic task. **15.4.8.K:** ~ Create a multimedia project using student-created digital media. **15.4.8.D:** ~ Create projects using emerging input technologies. **15.4.8.M:** ~ Explore and describe how emerging technologies are used across different career paths. **15.4.8.C:** ~ Compare and contrast peripheral devices of computing systems for specific needs. **CSTA K-12 CS Standards** (endorsed by PA but not yet PA Academic) **1B-IC-19 3-5** ~ Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users. **1B-IC-20 3-5** ~ Seek diverse perspectives for the purpose of improving computational artifacts. **1B-IC-21 3-5** ~ Use public domain or creative commons media, and refrain from copying or using material created by others without permission. **ISTE NETS** **NETS 4.A** ~ Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. **NETS 4.B** ~ Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. **NETS 4.C** ~ Students develop, test and refine prototypes as part of a cyclical design process. **NETS 4.D** ~ Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.