



This syllabus is subject to change as needed.

Quarter & Term:	2019-2020
Course Number & Title	AP Computer Science Principles
Instructor Name and email:	Mrs. Shannon Anderson-Rush, sanderson-rush@forsyth.k12.ga.us 678-979-7730 (cell)
Office Hours & Location:	5:00 p.m. – 8:00 p.m.
Delivery Method:	online: www.mrsrush.net
Pre-requisites:	None

COURSE INFORMATION

COURSE OBJECTIVES & COMPETENCY AREAS:

Course Description

The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. In this course, students will develop computational thinking skills vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends. The course is unique in its focus on fostering student creativity. Students are encouraged to apply creative processes when developing computational artifacts and to think creatively while using computer software and other technology to explore questions that interest them. They will also develop effective communication and collaboration skills, working individually and collaboratively to solve problems, and discussing and writing about the importance of these problems and the impacts to their community, society, and the world.

Java Development Environment

We will use BlueJ as our Integrated Development Environment. Students will need to download and install BlueJ Combined Installer appropriate for the operating system and type of computer. BlueJ is free and available from: <http://www.bluej.org/>

Greenfoot Interface

We will also be using the Greenfoot Interface to assist with Java programming. Greenfoot teaches object orientation with Java. Create 'actors' which live in 'worlds' to build games, simulations, and other graphical programs. Greenfoot is visual and interactive. Visualization and interaction tools are built into the environment. The actors are programmed in standard textual Java code, providing a combination of programming experience in a traditional text-

based language with visual execution. Students will need to download a copy of Greenfoot to USB drive. Greenfoot is free and available from: <http://www.greenfoot.org/download>

Required Text: 5 Steps to a 5: AP Computer Science Principles (2018) by Julie Schacht Sway. *Students are responsible for acquiring their own text. You can purchase through Amazon or Read It Again books in Johns Creek or any Barnes and Nobles.*

AP Test Information

You can receive college credit for AP Computer Science Principles by taking the AP CSP test. The score you need to achieve and whether you receive credit depends upon the individual college. The test is broken into two parts: two in class projects (Create & Explore) = 40% and 74 multiple choice questions = 60%. Details and deadlines for registration and payment will be shared throughout the year. It is the expectation that all students take the AP test and students with financial concerns should speak with their teacher.

The new College Board exam ordering system requires that all students create a College Board account if they have not done so already. Once students create an account, they will join their specific AP class via a join code. An additional change that has occurred within the AP program concerns the ordering deadlines for AP exams. Students will be required to register and pay for AP exams during the months of September and October. Details concerning the registration and payment process will be shared with students and parents at a later date.

- The AP test fee is ~\$123.00. More details will be provided September.

Students will indicate "intent" to take exam through the College Board portal but will need to register for the test and pay any testing fees to their base school. Students should listen for AP Test Registration announcements during September and October at their base school.

Nature of the Work in AP Computer Science

AP Computer Science is a college-level course. Students who pass the AP exam in May often earn college credit in Computer Science (requirements for credit vary by college). As such, students should not expect to have prepared reviews handed to them prior to quizzes and tests, and they should also not expect their tests to be essentially identical to their practice problems. Computer Science requires different types of critical thinking and problem-solving skills than other high school courses. There is also much reading in the course and a great demand for a high level of reading comprehension. Regular daily reading and programming practice is necessary to excel in this course. In order to prepare students for the AP exam, it is important that parents and students understand that we cannot lower our expectations for the course. Consistent practice and willingness to seek help early when they don't understand is by far the most effective way for students to adjust and thrive at this new level of rigor.

- Students who are not prepared to make the commitment required for the elements mentioned above and whose primary motivation in taking the course is for AP recognition/college admissions are generally not successful in this course.

- Students with poor attendance and/or poor study habits are generally not successful in this course.

Industry Credentialing/End of Pathway Assessments

Students are encouraged to select a career pathway beginning in the ninth grade that is connected to college and career goals. This course is one of three courses in the career pathway chosen by a student. At the conclusion of the third pathway course, students will be required to take an industry credentialing End of Pathway Assessment. This assessment provides students an opportunity to demonstrate what they have learned by completing an online, nationally recognized exam. Students who complete a pathway and earn an industry credential by passing the assessment will receive a graduation cord to signify their achievement.

AP Computer Science Principles is the second class in the Computer Science pathway, Design, Web Development, and Internet of Things pathways.

College Majors: Computer Science, Information Technology, Software Engineering, Computer Game Design and Development, etc.

Professions: Software Engineer, Computer Programmer, Computer Network Engineer, Database Administrator, Game Designer, Information Security, etc.

Required Assignments

Formative Assignments:

This class will have frequent homework and reading. Homework will sometimes be submitted for a grade. Students will frequently complete AP level free response questions and these will also sometimes be collected for a grade. The major component for this portion of the grade is question for thoughts and routine programming assignments. Programming assignments will be turned in through itsLearning, or by inspection in class. ALL assignments must be turned in by assigned due dates. Selected programming assignments will be graded in detail.

Summative Assignments:

The summative grade will come primarily from test scores and projects. There will be 4-5 tests in fall semester, plus a mid-term exam. There will be 4-5 tests in the spring semester. There will be two through course AP projects that will be counted as a summative grade. The "Final Exam" will cover all units in this course.

Independent Work Requirement (Extremely Important!):

While students will have the opportunity to work together and share ideas, both in and away from the classroom, every student is expected to turn in independent and original work. Students will not receive credit for submitted assignments that are substantially identical to work from other sources.

Course Curriculum Content

Course Standards	Units/Topics
-------------------------	---------------------

<p>APCSP LO 4.2.2 Explain the difference between solvable and unsolved problems in computer science APCSP EU 1.2 Computing enables people to use creative development processes to create computational artifacts for creative expression or to solve a problem APCSP LO 1.2.1 Create a computational artifact for creative expression</p>	<p>Introduction to Computer Science</p>
<p>APCSP LO 1.1.1 Apply a creative development process when creating computational artifacts APCSP LO 1.2.2 Create a computational artifact using computing tools and techniques to solve a problem APCSP LO 1.2.3 Create a new computational artifact by combining or modifying existing artifacts</p>	<p>Computer Science Careers</p>
<p>APCSP EU 2.1 A variety of abstractions built on binary sequences can be used to represent all digital data. APCSP EU 3.1 People use computer programs to process information to gain insight and knowledge APCSP LO 3.1.1 Find patterns and test hypotheses about digitally processed information to gain insight and knowledge APCSP LO 3.1.2 Collaborate when processing information to gain insight and knowledge APCSP LO 3.1.3 Explain the insight and knowledge gained from digitally processed data by using appropriate visualizations, notations, and precise language</p>	<p>Data Representation</p>
<p>APCSP LO 2.1.1 Describe the variety of abstractions used to represent data APCSP LO 2.1.2 Explain how binary sequences are used to present digital data APCSP LO 2.2.3 Identify multiple levels of abstractions that are used when writing programs APCSP EU 4.1 Algorithms are precise sequences of instructions for processes that can be executed by a computer and are implemented using programming languages APCSP LO 4.1.1 Develop an algorithm for implementation in a program APCSP LO 4.1.2 Express an algorithm in a language APCSP EU 4.2 Algorithms can solve many, but not all, computational problems APCSP LO 4.2.1 Explain the difference between algorithms that run in a reasonable time and those that do not run in a reasonable time APCSP LO 4.2.4 Evaluate algorithms analytically and empirically, for efficiency, correctness and clarity</p>	<p>Algorithm Analysis</p>
<p>APCSP EU 2.2 Multiple levels of abstraction are used to write programs or create other computational artifacts APCSP LO 2.2.1 Develop an abstraction when writing a program or creating other computational artifacts APCSP LO 2.2.2 Use multiple levels of abstraction to write programs APCSP LO 1.2.4 Collaborate in the creation of computational artifacts APCSP LO 1.2.5 Analyze the correctness, usability functionality, and suitability of computational artifacts APCSP EU 5.1 Programs can be developed for creative expression, to satisfy personal curiosity, to create new knowledge, or to solve problems APCSP LO 5.1.1 Develop a program for creative expression, to satisfy personal curiosity, or to create new knowledge APCSP LO 5.1.2 Develop a correct program to solve problems APCSP LO 5.1.3 Collaborate to develop a program</p>	<p>Computer Programming</p>

<p>APCSP EU 5.2 People write programs to execute algorithms APCSP LO 5.2.1 Explain how programs implement algorithms APCSP EU 5.3 Programming is facilitated by appropriate abstractions APCSP LO 5.3.1 Use abstraction to manage complexity in programs APCSP EU 5.4 Programs are developed, maintained, and used by people for different purposes APCSP LO 5.4.1 Evaluate the correctness of a program APCSP EU 5.5 Programming uses mathematical and logical concepts APCSP LO 5.5.1 Employ appropriate mathematical and logical concepts in programming</p>	
<p>APCSP EU 2.3 Models and simulations used abstraction to generate new understanding and knowledge APCSP LO 2.3.1 Use models and simulations to represent phenomena APCSP LO 2.3.2 Use models and simulations to formulate, refine, and test hypotheses APCSP EU 6.1 The Internet is a network of autonomous systems APCSP LO 6.1.1 Explain the abstractions in the Internet and how the Internet functions APCSP EU 6.2 Characteristics of the Internet influence the systems built on it APCSP LO 6.2.1 Explain characteristics of the Internet and the systems built on it APCSP LO 6.2.2 Explain how the characteristics of the Internet influence the systems built on it APCSP EU 6.3 Cybersecurity is an important concern for the Internet and the systems built on it APCSP LO 6.3.1 Identify existing cybersecurity concerns and potential options to address these issues with the internet and the systems built on it</p>	<p>Operation of the Internet</p>
<p>APCSP LO 4.2.3 Explain the existence of undecidable problems in computer science APCSP EU 7.1 Computing enhances communication, interaction, and cognition APCSP LO 7.1.1 Explain how computing innovations affect communication, interaction, and cognition APCSP LO 7.1.2 Explain how people participate in a problem-solving process that scales APCSP EU 7.2 Computing enables innovation in nearly every field APCSP LO 7.2.1 Explain how computing has impacted innovations in other fields APCSP EU 7.3 Computing has global effects – both beneficial and harmful on people and society APCSP LO 7.3.1 Analyze the beneficial and harmful effects computing APCSP EU 7.4 Computing innovations influence and are influenced by economic, social, and cultural contexts in which they are designed and used APCSP LO 7.4.1 Explain the connections between computing and real-world contexts, including economic, social, and cultural contexts APCSP EU 7.5 An investigation process is aided by effective organization and selection of resources. Appropriate technologies and tools facilitate the accessing of information and enable the ability to evaluate the credibility of sources. APCSP LO 7.5.1 Access, manage, and attribute information using effective strategies</p>	<p>Innovation & Problem Solving</p>

APCSP LO 7.5.2 Evaluate online and print sources for appropriateness and credibility	
APCSP LO 3.2.1 Extract information from data to discover and explain connections or trends APCP LO 3.2.2 Determine how large data sets impact the use of computational processes to discover information and knowledge APCSP EU 3.3 There are trade-offs when representing information as digital data APCSP 3.3.1 Analyze how data representation, storage, security, and transmission of data involve computational manipulation of information APCSP EU 3.2 Computing facilitates exploration and the discovery of connections in information APCSP EU 1.3 Computing can extend tradition forms of human expression and experience APCSP LO 1.3.1 Use computing tools and techniques for creative expression	Managing Data in a Digital World

STUDENT LEARNING OBJECTIVES:

The AP Computer Science Principles Course Standards will be provided to each student in PDF format through itsLearning, including a detailed list of objectives and topics within each objective. The standards may also be accessed at: <https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-computer-science-principles-course-and-exam-description.pdf>

Forsyth Virtual Academy Policies

GRADING POLICY: 90-100=A; 80-89=B; 70-79=C; Below 70=F

LATE POLICY: -20%

MID-TERM & FINAL EXAM: 2 summatives each. Mid-term and/or final exam will not replace any grade. Final exam can be exempted if course grade is a 90% or higher.

GRADING SCALE: Assignments (including quizzes): 25%; Tests: 75%
 Assignments/Tests are expected to be submitted by the end of the week unless the instructor is contacted in advance of the due date. All late assignment will be accepted in accordance with FVA late work policy.

INSTRUCTIONAL METHODOLOGY USED: Presentations, quizzes, tests, lecture, assignments, access to publisher website, discussions, and evaluations

WORK ETHICS: To promote positive behaviors, Students will discuss the following topics: Attendance, character, teamwork, appearance, attitude, productivity, organization, communication, cooperation and respect. A separate grade will be given to the student. 1=unacceptable; 2=acceptable and 3=above average

ATTENDANCE REGULATIONS: Attendance will be tracked and marked in Infinite Campus. Attendance is based on assignment completion in itsLearning in accordance with FVA attendance policy. Attendance will also be tied to amount of work complete and submitted by the due date. Students will lose their driver's license (the ability to apply for a driver's license) if absent for 10 or more days in a school year.

PLAGIARISM/CHEATING: Making false representations to the Academy, including forgery and unauthorized alteration of documents, unauthorized use of any document or instrument of identification. This includes looking at other students itsLearning and copying answers. See the Student Handbook for specifics on Academic dishonesty, including, but not limited to, dishonesty in quizzes, tests, or assignments.

EMAIL COMMUNICATION: ItsLearning email is the official medium for communication with students at Forsyth Virtual Academy. Students should monitor their ItsLearning email daily.