AP Computer Science Principles

Part I: Web Development

This part of the course will introduce students to the fundamentals of designing for the web. While the web has changed much over the years since it's inception, several major technologies have been widespread throughout. These are HTML, CSS and JavaScript. These will be the major focus on this part of the course. In addition to technologies we will explore design paradigms that are common in web design. We will discuss the Software Development life cycle as well as Mobile First and Responsive design that are important for today's web, which must be accessed from many devices.

Unit 1: HTML and CSS

Students will learn the basic building blocks of the web. Students will create simple websites and style them with CSS. Students will become familiar with basic workflows associated with coding and publishing code.

Unit 2: Design Process

In this unit students will study design processes used in industry, in particular students will get experience with the Software Development Life Cycle and learn how to plan and execute projects.

Unit 3: Libraries and Advanced Web Design

Students will learn how to use open-source libraries to create modern looking websites. In this unit students will learn that it is not necessary to reinvent the wheel and will create their own boilerplate sites that they can adapt to future problems.

Unit 4: JavaScript

JavaScript is the most widely used programming language on the web. Students will begin exploring JavaScript to create basic interactive websites as well as to create simple web-based games.

Unit 5: AP Explore Performance Task

AP Computer Science Principles assessments include an AP Explore Performance Task. This task involves the creation of computational artifacts as well as a written response. For more information about the AP Explore Performance task refer to the AP CSP Course and Exam Description.

Part II: Mobile App Development

In the second part of this course we will focus on Mobile App Development using the Java programming language. Java is distinct from JavaScript and is used broadly throughout industry on millions of devices. This portion of the course will focus on developing games for the Android operating system, however the programming and computational thinking skills learned will be transferable to a broad range of computer science problems.

Unit 6: Software Design

Students will revisit the Software Development Life Cycle and learn some principles of Agile development using Scrum.

Unit 7: Fundamentals of Java Programming

In this unit students are shown several programming fundamentals in the Java language. Students will be familiar with some of the ideas from JavaScrip and will learn the syntax of Java. Students will gain familiarity with concepts such as variables, conditionals, loops and many more.

Unit 8: Introduction to App Development

App development using Java is a distinct skill. Students will gain familiarity with Android Studio and how to create basic apps for Android devices.

Unit 9: Pong

Students will learn programming and app development concepts by being walked through the development of the famous game Pong.

Unit 10: AP Create Performance Task

AP Computer Science Principles assessments include an AP Create Performance Task. This task involves the creation of a video of a working program, a written response and completed program code. For more information about the AP Explore Performance task refer to the AP CSP Course and Exam Description.

Part III: Computers and the Internet

The final part of the course involves learning the fundamentals of how computers and the Internet work. Students will explore the basics of how computers represents data, how people agree on those data representations, and how protocols are developed to allow complex communication to occur across millions of devices. Students will consider ethical issues associated with such connectivity.

Unit 11: Modern Computer Systems

A modern computer system involves many components working together seamlessly to create the computing experiences we are familiar with today. Students will understand how the systems are used, what vulnerabilities are associated with different computing paradigms, and how different parts of society uses and depends on computers.

Unit 12: The Internet

The Internet is a singular modern phenomenon that has created much innovation as well as strife. Students will explore the inner workings of the internet as well as the social and ethical issues surrounding global connectivity.