



## Mass Academy of Math and Science Advanced Computer Science

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# Advanced Computer Science

### Course Description

The Computer Science course begins with web design techniques and implementation using HTML and CSS. Students will be responsible for developing and maintaining their own personal and professional electronic portfolio in the form of a web site. This course will teach the fundamental ideas of object-oriented methodologies through the widely-used Java programming language. Topics include data types and structures, decisions, iteration and recursion, designing and implementing classes, graphics, algorithms and standard input/output. Students will learn how to analyze software programs through test and validation, and also learn how to use the software engineering lifecycle model. Students will also be responsible for developing a software product.

### What is Computer Science (CS)?

The study of Computer Science involves a variety of topics such as analysis and design of algorithms, software design techniques, learning programming languages, software engineering, distributed computing, and mathematical analysis. Computer scientists study how to efficiently organize, store and retrieve data, how to write efficient programs, explore the limits of algorithmic techniques, develop new applications that benefit society, and design effective interfaces between programs and humans.

### What languages are used in the Computer Science course?

Computer Science is primarily taught in Java using the Eclipse integrated development environment. Other languages used include HTML, CSS, and JavaScript. In addition, mobile application technologies (Android, iOS) are also encountered.

### Is this an Advanced Placement (AP) Computer Science course?

This is not an official AP Computer Science course; however, the topics that will be covered are closely aligned with the AP Computer Science A curriculum. Some of the content areas are also aligned with the AP CS Principles framework.

### What if I am new to Computer Science or have some experience programming?

There are opportunities for differentiated instruction where students in the class are working on different assignments, projects, and/or technologies. Many individual assignments are also differentiated in terms of their requirements.

### Do I need to own my own personal computer or laptop?

Owning a computer is advantageous in terms of ease and convenience to work on assignments at any given time. However, we do not require you to have your own computer or laptop. The computer labs are open for student use during school hours and equipped with the necessary software required for classes.