

# COMPUTER SCIENCE

## Program Design / Sequence

The Computer Science Department offers hands on computer programming courses covering a wide range of student experiences and abilities. *Introduction to Computer Science* in Python is intended for students with an interest in computers but little or no programming experience. The *AP Computer Science* course is for students with considerable programming experience who may be planning a computer-related college major. Many of the Computer Science courses are self-paced and in an online-learning environment with a teacher as a facilitator and for technical support. Students should consider their time management skills and ability to navigate online courses when choosing to enroll in Computer Science.

We encourage all students to engage in Computer Science coursework as programming and navigating software and hardware are quickly becoming a minimum expectation for the workforce. A layout of the courses available and the expected knowledge base is listed below:

<b>Beginner</b>	<b>Intermediate</b>	<b>Advanced</b>
Computer Applications	AP Computer Science Principles	Computer Science EdX
Website Design	Computer Technician	AP Computer Science A
Intro to Computer Science	Independent Study	

## Grades 9-12 Course Descriptions

**200 ADVANCED PLACEMENT COMPUTER SCIENCE A (Java) Level: AP**  
**Grades: 10, 11, 12 By Application Full Year - 5 Credits**

Advanced Placement students work to guidelines provided by the College Entrance Examination Board (CEEB), which oversees the Advanced Placement program. This course follows the CEEB AP Computer Science curriculum. Topics include specification, design, and implementation of programs; type and constant definitions; scope of variables; functions; arrays and classes; algorithms for searching and sorting data; and the responsible use of computer systems. Additional topics in dynamic data structures will be covered for students preparing for the AP Computer Science exam.

*All students enrolled in this course are required to take the AP Computer Science exam administered in May.*

**Prerequisite:** *Algebra and Geometry or Introduction to Computer Science (Java)*

**XXX ADVANCED PLACEMENT COMPUTER SCIENCE PRINCIPLES Level: AP**

**Grades 10, 11, 12**

**By Application**

**Full Year-5 Credits**

The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. The course introduces student to the central ideas of computer science, instilling the ideas and practices of computational thinking and inviting students to understand how computing changes the world. The rigorous course promotes deep learning of computational content, develops computational thinking skills, and engages students in the creative aspects of the field. **All students enrolled in this course are required to take the AP Computer Science Principles exam administered in May.**

**Prerequisites:** *Algebra and Geometry or Introduction to Computer Science*

**Learning Expectations:** II, IV, V

**Tech Competencies:** 7

**201 Introduction to Computer Science**

**Grades: 9-12**

**Elective**

**Unleveled**

**Half Year - 2.5 Credits**

This course introduces the fundamental concepts of computer programming using the Python programming language. The course emphasizes the basic elements of programming including fundamental data types, input and output, conditional branching, looping, operators, and classes. The course is self-paced and in an online learning environment.

**Prerequisite:** *Completion of Algebra 1*

**199CS Computer Technician Independent Study**

**Grades 10, 11, 12**

**By Application**

**Unleveled**

**Full-Year – 5 Credits**

Students learn the essential skills to troubleshoot Apple products by independently working through the AppleCare Technician training materials and by working with the Duxbury Public Schools computer technology department. Students must apply to take this course. Applications are available in the guidance office.

~~**207 COMPUTER APPLICATIONS**~~

~~**Unleveled**~~

~~**Grades: 9-12**~~

~~**Elective**~~

~~**Half Year - 2.5 Credits**~~

~~This class combines in one course both common software applications and an introduction to programming concepts. High school students should possess a good general knowledge of common computer processing applications such as desktop publishing, spreadsheet applications, database management, presentation programs, multimedia software, and basic programming skills. This project-based course provides students with the opportunity to explore a variety of computer technology applications and meet many of the district's technology graduation requirements. Students are encouraged to continue on in programming or application classes upon the completion of this course.~~

**206 WEB SITE DESIGN****Grades: 10, 11, 12****Elective****Unleveled****Half Year - 2.5 Credits**

This course will introduce students to some of the basic concepts of web site design and management. Students will work in small teams to design and maintain their own classroom web sites. Topics include a brief history of the Internet, an introduction to HTML, and some principles of web site design.

**207 Computer Science EdX****Grades 9-12****By Application****Unleveled****Half Year – 2.5 credits**

Students who have completed available Computer Science courses within the district can apply to take two self-paced EdX computer science courses in a given semester.

Coursework must be justified in terms of students intended career path and pertinent to that course of study. Courses cannot be courses that are offered within the Computer Science Department. Approval process for this course will include the process and procedures standard to the Independent Study process.

**Pre-requisites:** *AP Computer Science A or AP Computer Science Principles (EdX course can also be used to complete an Intro to Java course for students wishing to pursue AP at a later date.)*