

Computer Science

<u>Course #</u>	<u>Course Title</u>	<u>Open to:</u>
3210A	Keys to Computer Science	9, 10, 11, 12
3230B	Artificial Intelligence	9, 10, 11, 12
3230A	Cybersecurity and Ethical Hacking	9,10, 11, 12
3243/3244	Advanced Placement Computer Science Principles	10,11, 12
3251/3252	Advanced Placement Computer Science A	10, 11, 12
003210B	Solving Big Problems with Big Data	9, 10, 11, 12

COMPUTER SCIENCE

3210A KEYS TO COMPUTER SCIENCE

Prerequisite: Algebra
 Grades: 9, 10, 11, 12
 Semester/.5 credit

Whether it's 3-D animation, engineering, music, app development, medicine, visual design, robotics, or political analysis, computer science is the engine that powers the technology, productivity, and innovation that drive the world. Computer Science experience has become imperative for students' success in the workforce of tomorrow. This is a survey course in Computer Science that allows students to explore algorithms and programming with *Python*[™], networks and the underlying technologies of the Internet, smart devices, Big Data, Artificial Intelligence, cybersecurity, and the impacts of computing.

3230B ARTIFICIAL INTELLIGENCE

Prerequisite: Keys to Computer Science or previous Computer Science 1 course
 Grades: 9, 10, 11, 12
 Semester/.5 credit

Artificial Intelligence (AI) is not the fictional killer robot you may have seen in the movies...it's much realer and more tangible! AI is driving the next wave of technological innovation and is changing almost every industry around us. AI is how *Netflix*[™], *Prime*[™], and *TikTok*[™] know what video you'll love next, how *Pandora*[™], *Spotify*[™], and *SoundCloud*[™] know which songs to recommend to you. AI is how self-driving cars avoid pedestrians, how *Siri*[™], *Google*[™], and *Alexa*[™] understand your sentences, and it's much, much more.

Study the foundations of Artificial IntelligenceI: Natural Language Processing, Computer Vision, Machine Learning, and Neural Networks. Explore different careers that use or create AI and the ethics of AI making decisions *about* and *for* humans.

3230A CYBERSECURITY AND ETHICAL HACKING

Prerequisite: Keys to Computer Science or previous Computer Science 1 course
 Grades: 9, 10, 11, 12
 Fall Semester/.5 credit

Explore personal, system, and network security in a project, problem, and activity-based environment. Identify the need for cybersecurity in our modern world and study common cybersecurity attacks, concepts, and techniques. Learn to protect personal data and privacy, protect others from social engineering and vulnerabilities in devices and apps, secure systems and networks by using basic defensive monitoring tools, and build an offensive agent to test vulnerabilities in a system. Investigate career paths related to cybersecurity.

****Can be taken for college credit with paid college fee****

3251/3252 ADVANCED PLACEMENT COMPUTER SCIENCE A

Prerequisite: Keys to Computer Science or previous Computer Science 1 course

Grades: 10, 11, 12

Credit: 1

AP Computer Science A will introduce you to software engineering using the Java programming language. You can expect to learn how to design, implement, and analyze solutions to problems; use and implement commonly used algorithms; use standard data structures; create, run, test, and debug solutions in the Java programming language, utilizing standard Java library classes and interfaces from the AP Java subset; read and understand programs consisting of several classes and interacting objects; and understand the ethical and social implications of computer use. You can also expect to plan and implement several large-scale and complex projects. This course will also help prepare you for the College Board's AP Computer Science A Exam in May. The AP Computer Science A course is equivalent to a traditional first-semester, college-level course within a computer science-related major.

NWTC Credit for Prior Learning Program

3243/3244 ADVANCED PLACEMENT COMPUTER SCIENCE - PRINCIPLES

Prerequisite: Keys to Computer Science or previous Computer Science 1 course

Grades: 10,11, 12

Credit: 1

AP Computer Science Principles will allow you to discover the central ideas of computer science. This AP course does not aim to teach the specifics of a single programming language or focus on software engineering (that is the focus of the AP Computer Science A course), but aims instead to help you develop innovative computational artifacts using the same creative processes artists, writers, computer scientists, and engineers use to bring ideas to life with the *Python*TM programming language.

Course topics include Representing and Transmitting Information on the Internet; Encoding and Compressing Digital Text, Audio, Images, and Video; Algorithm Design; Object-Oriented Programming (OOP) and Application Programming Interfaces (APIs); Big Data; and Cybersecurity. This course will also help prepare you for the College Board's AP Computer Science Principles Performance Tasks and the AP Computer Science Principles Exam in May. **NWTC Credit for Prior Learning Program**

003210B SOLVING BIG PROBLEMS WITH BIG DATA

Prerequisite: Keys to Computer Science or previous Computer Science 1 course

Grades: 9, 10,11, 12

Credit: .5

This course is an exploration of problem-solving and the application of computational tools to solve messy, real-world problems with BIG Data! Examples include, but aren't limited to: biologists working with genomic data sets to answer pressing medical questions; journalists analyzing historical texts for patterns to put political conflict into perspective, and artists creating beautiful visualizations from real-time data streams like *Twitter*TM to communicate social sentiment.

This course will examine the societal and political implications of computing systems and allow you to:

- See the relevance of computing to your personal interests.
- See that computing is a learnable skill rather than a mysterious and secret endeavor.
- See that computing has social impacts around the world.
- Develop “computational thinking” skills.

This course is designed to be both practical and fun! You're going to learn valuable skills and a new way of thinking about the world!