

Department: Mathematics

Course Title: AP Computer Science Principles

The College Board: <https://advancesinap.collegeboard.org/stem/computer-science-principles>

Date: FALL 2017

Grade Level: 10, 11, 12

Prerequisite/Requirements: C or better in Geometry

Costs to Students: 16GB+ flash drive, home/laptop computer with access to internet is suggested.

Course Duration: Fall 2017 (Approximately 85 each, 75 minute class periods)

Course Description: AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles also gives students the opportunity to use current technologies to create computational artifacts for both self-expression and problem solving. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science.

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Location: Room 717

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Teacher Resource Materials:

Primary text: Parsons, June. *New Perspectives on Computer Science 2016: Comprehensive*. 18th ed. National Geographic/Cengage Learning

Secondary Texts: Schneider, G. Michael, Judith Gresting. *Invitation to Computer Science*. 7th ed. National Geographic/Cengage Learning

On-line Resources:

- Microsoft Visual Basic for Beginners: https://mva.microsoft.com/en-US/training-courses/visual-basic-fundamentals-for-absolute-beginners-16507?l=iqMOvLKbC_9206218965
- Hyper Text Markup Language (HTML): <http://htmldog.com/guides/html/beginner/> (plus many more)

Course Overview: AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles also gives students the opportunity to use current technologies (Excel, HTML, and Visual Basic) to create computational artifacts (small applications) for both self-expression and problem solving. Teaching materials for the course will come from textbooks, classroom lectures, online videos, and the internet. Computer labs are THE major part of the course. Typically, students will receive 30 minutes of demonstrated instruction on new concepts but then will be required to duplicate and develop these concepts in code the remaining 45 minutes of each class period. *Notes/code will be stored in the cloud.*

As the course progresses, the associated AP released questions and available practice exams will be reviewed. The examinations will be patterned after the AP exam and will consist of multiple choice and free response questions but will also have a lab coding component (see scoring/evaluation below and view: http://apcentral.collegeboard.com/apc/public/exam/exam_information/231726.html). Questions will be modeled after those found on the AP website or related materials. Students are recommended to visit the AP stats website regularly to take advantage of the site's study materials.

Visit the **The AP Computer Science Principles Exam Page which may be viewed at:**

http://apcentral.collegeboard.com/apc/public/exam/exam_information/231726.html

The AP Computer Science Principles scoring/evaluation has two (2) parts:

- **Two Performance Tasks** | 40% of Overall AP Score
 - Explore — Impact of Computing Innovations | 16% | 8 hours
 - Create — Applications from Ideas | 24% | 12 hours
- **End-of-Course Exam:** 74 Questions | 2 Hours | 60% of Overall AP Score (single-select and multiple-select questions)

Specific classroom rules / expectations / notebook requirements will be a separate handout at the beginning of the course. An AP Exam review will be offered prior to the Fall 2017 AP exam, circumstances permitting.

Course Goals: The goals of the AP Computer Science Principles course are comparable to those in the introductory course for computer science majors offered in college and university computer science departments. It is not expected, however, that all students in the AP Computer Science Principles course will major in Computer Science Principles at the university level. The AP Computer Science Principles course is intended to serve both as an introductory course for computer science majors and as a course for people who will major in other disciplines that require significant involvement with technology. It is not a substitute for the usual college-preparatory mathematics courses. The course's goals are twofold:

1. Major areas of study are to study, acknowledge, and understand:
 - Creativity in innovation
 - Abstraction to facilitate focus on problem solving
 - Data and information
 - Algorithms
 - Programming
 - The Internet
 - Global Impact
2. Computational Thinking Practices
 - Connecting computing to draw connection between different computing concepts
 - Creating computational artifacts
 - Abstracting to model/simulate real-world phenomenon
 - Analyzing problems and artifacts for efficiency and accuracy
 - Communicating the impact of computing and technology with their appropriateness
 - Collaborating on the design and use of data sets and artifact