

AP[®] Computer Science A

About the Advanced Placement Program[®] (AP[®])

The Advanced Placement Program[®] has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

AP Computer Science Program

There are two computer science offerings, and students can take either course in any order or concurrently:

- **AP Computer Science A** focuses on computing skills related to programming in Java.
- **AP Computer Science Principles** provides students with a broad introduction to computer science and how it relates to other fields.

The courses underscore the importance of communicating solutions appropriately and in ways that are relevant to current societal needs. AP Computer Science courses can help address traditional issues of equity, access, and broadening participation in computing while providing a strong and engaging introduction to fundamental areas of the discipline.

AP Computer Science A Course Overview

AP Computer Science A introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language.

PREREQUISITES

It is recommended that students have successfully completed a first-year high school algebra course with a strong foundation of basic linear functions, composition of functions, and problem-solving strategies that require multiple approaches and collaborative efforts. In addition, students should be able to use a Cartesian (x, y) coordinate system to represent points on a plane. It is important that students and their advisors understand that any significant computer science course builds upon a foundation of mathematical reasoning that should be acquired before attempting such a course.

Prior computer science experience is not required to take this course.

COMPUTER LANGUAGE

The course requires that solutions of problems be written in the Java programming language. Because the Java programming language is extensive, the AP Computer Science A Exam covers a subset of Java.

LAB REQUIREMENT

The AP Computer Science A course must include a minimum of 20 hours of hands-on, structured lab experiences to engage students in individual or group problem solving. Each course includes a substantial lab component in which students design solutions to problems, express their solutions precisely, test their solutions, identify and correct errors, and compare possible solutions. The College Board has developed

several labs that are aligned to the course framework that fulfill the 20-hour lab requirement.

AP Computer Science A Course Content

The course content is organized into ten commonly taught units:

- **Unit 1:** Primitive Types
- **Unit 2:** Using Objects
- **Unit 3:** Boolean Expressions and `if` Statements
- **Unit 4:** Iteration
- **Unit 5:** Writing Classes
- **Unit 6:** Array
- **Unit 7:** `ArrayList`
- **Unit 8:** 2D Array
- **Unit 9:** Inheritance
- **Unit 10:** Recursion

The following big ideas serve as the foundation of the course, enabling students to create meaningful connections among concepts:

- **Modularity:** Modularity in object-oriented programming allows us to use abstraction to break complex programs down into individual classes and methods.
- **Variables:** Variables create data abstractions, as they can represent a set of possible values or a group of related values.
- **Control:** Doing things in order, making decisions, and doing the same process multiple times are represented in code by using control structures.
- **Impact of Computing:** Computers and computing have revolutionized our lives. To use computing safely and responsibly, we need to be aware of privacy, security, and ethical issues.

AP Computer Science A Computational Thinking Practices

The following computational thinking practices describe what skills students should develop during the course:

- **Program Design and Algorithm Development:** Determine required code segments to produce a given output.
- **Code Logic:** Determine the output, value, or result of given program code given initial values.
- **Code Implementation:** Write and implement program code.
- **Code Testing:** Analyze program code for correctness, equivalence, and errors.
- **Documentation:** Describe the behavior and conditions that produce identified results in a program.

Advanced Placement Computer Science Study Guide

Kim Magloire, Princeton Review (Firm)



Advanced Placement Computer Science Study Guide:

Cracking the AP Computer Science, 2004-2005 Mehran Habibi, Michael Fritz, Robb Cutler, 2004-02-10 The Princeton Review realizes that acing the AP Computer Science Exam is very different from getting straight A's in school. We don't try to teach you everything there is to know about computer science; only what you'll need to score higher on the exam. There's a big difference. In *Cracking the AP Computer Science A/AB Exams*, we'll teach you how to think like the test makers and focus on what the AP testers really want you to know with a complete review of Java language used on the exam. Learn techniques to help you navigate the multiple choice and free response questions. Brush up specific skills with practice questions throughout the book and full-length practice tests for the AP Computer Science A and AB exams. This book includes 2 full-length practice tests, one each for the AP Computer Science A and AB exams. All of our practice test questions are like the ones you'll see on the actual exam, and we fully explain every answer. **Java Concepts** Frances P. Trees, Cay S.

Horstmann, 2007-10-16 A study guide for AP computer science studies in Java. Compatible with Java 5 and 6. The *Java Concepts Advanced Placement Computer Science Study Guide* is a companion piece to the main text *Java Concepts for AP Computer Science 5e*. It moves students forward in their studies of Java while presenting and reinforcing skills and knowledge that is tested on the AP Computer Science A and AB examinations. The study manual supports the primary textbook by sharing examples and explanations of Java. Practice questions and tips are also provided to help users prepare for the computer science exam. **Java Programming** Steven P. Warr, 2011 Learning a programming language on your own can be daunting. Programming books can be confusing and incomplete. Program listings often do not work until you have mucked around using trial and error. I like to use books as reference after I have read them. Invariably, none of the books have the particular information that I want, nor do they have references to other information sources. *Java Programming: What Do You Want To Do?* changes all that. Inside, there are clear instructions on how to do what you want to do. Basic structures, graphics programming with AWT and NetBeans, advanced structures, test preparation, networking, cell phone programming, and much more.

Cracking the Advanced Placement Spanish, 2004-2005 Princeton Review (Firm), 2004 The fiercer the competition to get into college, the more schools require that students prove themselves in other ways than SAT scores and grade point averages. The more expensive college educations become, the more students take advantage of the opportunity to test out of first-year college courses. Includes 2 sample tests with full explanations for all answers. The Princeton Review's proven score-raising skills and techniques. Complete subject review of all the material likely to show up on the AP Spanish exam.

Cracking the AP Biology Exam Kim Magloire, Princeton Review (Firm), 2004 This updated series by Princeton Review helps students pass the challenging Advanced Placement Test with targeted study for each exam of the series.

Resources in Education, 1997 *Cracking the Advanced Placement Computer Science A Exam* Princeton Review (Firm), 2019 Ace the 2020 AP Computer Science A Exam with this comprehensive study guide including 2 full-length practice

tests thorough content reviews targeted strategies for every section of the exam and access to online extras Worldcat

Addison-Wesley's Review for the Computer Science AP Exam in C++ Susan B. Horwitz,1998 This complete test guide for AP Computer Science Exam in C features four comprehensive sample exams to prepare for the exam day covers a full range of C topics includes an extensive glossary that provides quick reference and contains test taking hints that pinpoint the important aspects of the questions included on the exam **Cracking the AP Chemistry** Paul Foglino,Princeton Review (Firm),2004 The fiercer the competition to get into college the more schools require that students prove themselves in other ways than SAT scores andgrade point averages The more expensive college educations become the more students take advantage of the opportunity to test out offirst year college courses Includes 2 sample tests with full explanations for all answers The Princeton Review s proven score raising skills and techniques Complete subject review of all the material likely to show up on the AP Chemistry exam How to Prepare for the AP Computer Science Exam Roselyn Teukolsky,2003-08-01 This new Java edition of the AP Computer Science manual presents four full length AP Computer Science practice exams with questions answered and explained Two are A exams two are AB exams and all four are modeled on the actual exam A general subject review covers all topics tested on the exam including Java language features classes and objects inheritance and polymorphism program design and analysis one and two dimensional arrays recursion linked lists stacks queues and priority queues trees collections and sorting and searching A final chapter describes the Marine Biology Simulation Case Study

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web rules of softball each team consists of 9 players and teams can be of mixed gender a game lasts for 7 innings and is split into two sections the top and bottom of the innings each team bats once in each innings before the sides switch the fielding team has a pitcher catcher a player on first base second base third base three deep

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