25-Hour AP Computer Science A Syllabus

This syllabus is designed for a 25-hour review or crash course covering all key topics of the AP Computer Science A curriculum. Each session is approximately 1 hour, including both instruction and practice time.

Session 1: Course Overview + Java Basics

- [ ] - Course format and exam layout (MCQ + FRQ)
- [ ] - Java basics: main, System.out.println, variables, and data types

Session 2: Primitive Types

- [ ] - int, double, boolean
- [ ] - Arithmetic operations
- [ ] - Casting and order of operations

Session 3: Using Objects

- [ ] - Creating and using objects
- [ ] - Constructors
- [ ] - Method calls (String, Math classes)

Session 4: Boolean Expressions and If Statements

- [ ] - Relational and logical operators
- [ ] - if, else if, else constructs
- [ ] - Truth tables and short-circuiting

Session 5: Practice Day (Units 1–4 Review)

- [ ] - Multiple choice + FRQ snippets
- [ ] - Logic puzzles with if statements

Session 6: Iteration (Loops)

- [ ] - while, for, and for-each
- [ ] - Loop control and common mistakes

Session 7: Writing Classes (OOP Basics)

- [ ] - Instance variables, constructors, and methods
- [ ] - this keyword

Session 8: Constructor and Method Overloading

- [ ] - Overloading examples

- [ ] - Encapsulation and accessors/mutators

Session 9: Practice Day (Classes + Loops)

- [ ] - Coding and tracing class behaviors
- [ ] - Nested loops and real-world applications

Session 10: Array Basics

- [ ] - 1D arrays: declaration, initialization, traversal

Session 11: Array Algorithms

- [ ] - Searching, replacing, summing, max/min

Session 12: ArrayList

- [ ] - Methods: add, remove, get, set
- [ ] - Differences between ArrayList and arrays

Session 13: Practice Day (Arrays + ArrayLists)

- [ ] - FRQs and algorithm tracing

Session 14: 2D Arrays

- [ ] - Declaration and access
- [ ] - Nested loop traversal

Session 15: Inheritance Basics

- [ ] - extends keyword
- [ ] - super keyword and constructors

Session 16: Polymorphism

- [ ] - Dynamic binding
- [ ] - Overriding methods
- [ ] - Abstract classes/interfaces (brief overview)

Session 17: Practice Day (Inheritance + 2D Arrays)

- [ ] - Tracing polymorphic behavior
- [ ] - Coding 2D array algorithms

Session 18: Recursion

- [ ] - Base case and recursive case
- [ ] - Tracing recursion and identifying output

Session 19: Big-O Notation + Sorting Algorithms (Optional)

- [ ] - Big-O of common loops
- [ ] - selectionSort, insertionSort, mergeSort (brief overview)

Session 20: AP FRQ Strategies

- [ ] - Scoring guidelines
- [ ] - Time management
- [ ] - Sample FRQ walkthrough

Session 21: FRQ Practice Day #1

- [ ] - Focus: Array and ArrayList questions

Session 22: FRQ Practice Day #2

- [ ] - Focus: Class design and inheritance questions

Session 23: MCQ Practice

- [ ] - Full-length practice questions
- [ ] - Time simulation and analysis

Session 24: Mixed Practice + Weak Spot Review

- [ ] - Recap missed concepts
- [ ] - Tailored review based on prior practice

Session 25: Mock Exam Simulation + Wrap-up

- [ ] - Timed section of MCQ + FRQs
- [ ] - Review strategies, pacing tips, motivation