



# CodeHS

## AP Java Course Syllabus

### Course Overview and Goals

The CodeHS AP Java course is a year-long course designed to help students master the basics of Java and equip them to successfully pass the College Board AP Computer Science A Exam at the end of the school year.

All learning materials and resources teachers and students need for a successful year-long AP Java course can be found on the CodeHS website. The course is broken down into video tutorials, quizzes and assessments, sample problems and written programming exercises. The content is fully web-based, with students writing and running code in the browser. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give more 1-on-1 attention to students.

### Prerequisites

There are no official prerequisites for the CodeHS AP Java course, however we highly recommend that students take our Introduction to Computer Science prior to AP Java (more info at [codehs.com/library](https://codehs.com/library)). Students who have completed our Intro to CS course will be able to apply knowledge of concepts covered in the Intro course to the more advanced setting of the AP Java course.

### College Board Curriculum Requirements

The CodeHS AP Java course is fully College Board aligned and covers all seven curriculum requirements extensively as shown in the table below. The curriculum requirements laid out by the College Board are:

- ❖ CR1: Teaches students to design and implement computer-based solutions to problems.
- ❖ CR2: Teaches students to use and implement commonly used algorithms and data structures.

- ❖ CR3: Teaches students to select appropriate algorithms and data structures to solve problems.
- ❖ CR4: Teaches students to code fluently in an object-oriented paradigm using the programming language Java.
- ❖ CR5: Teaches students to use standard Java library classes from the AP Java subset delineated in Appendix A of the AP Computer Science A Course Description.
- ❖ CR6: Includes a structured-lab component composed of a minimum of 20 hours of hands-on lab experiences.
- ❖ CR7: Teaches students to recognize the ethical and social implications of computer use.

## Course Breakdown

### Unit 1: Introduction to Programming with Karel

- ☐ Instructional Weeks: 1-3
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR3, CR4, CR5, CR6, CR7
- ☐ Subtopics Covered:
  - ☐ Commands, Methods, Loops, Conditionals, Classes, Top Down Design

### Unit 2: Computer and Java Basics

- ☐ Instructional Weeks: 4-13
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR5, CR6, CR7
- ☐ Subtopics Covered:
  - ☐ Binary, Ethics, Printing, Variables, Types, Arithmetic Expressions, Casting, I/O, Errors, Math, Loops, If/Else, Debugging, Nested Control Structures, Strings

### Unit 3: Methods

- ☐ Instructional Weeks: 14-16
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR5, CR6
- ☐ Subtopics Covered:
  - ☐ Methods, Parameters, Return Values

### Unit 4: Classes and Object Oriented Programming

- ☐ Instructional Weeks: 17-23
- ☐ Curriculum Requirements Covered

- ☐ CR1, CR5, CR6
- ☐ Subtopics Covered:
  - ☐ What Are Classes? Using Classes, Writing Our Own Classes, Methods, Instance Variables, Constructors, Visibility, Static, This, Super, Designing Classes

#### Unit 5: Files

- ☐ Instructional Weeks: 24-25
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR5, CR6
- ☐ Subtopics Covered:
  - ☐ Files Reading/Writing

#### Unit 6: Arrays

- ☐ Instructional Weeks: 26-29
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR2, CR5, CR6
- ☐ Subtopics Covered:
  - ☐ Basic 1D Arrays, Using ArrayList Class, Basic 2D Arrays

#### Unit 7: Searching and Sorting

- ☐ Instructional Weeks: 30-32
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR2, CR5, CR6
- ☐ Subtopics Covered:
  - ☐ Sequential, Binary, Selection, Insertion, Mergesort, Interfaces, Polymorphism, Basic Recursion

#### Unit 8: AP Test Review and Final Project

- ☐ Instructional Weeks: 33-37
- ☐ Curriculum Requirements Covered
  - ☐ CR1, CR6
- ☐ Subtopics Covered:
  - ☐ Review for AP Test, Final Project

## Curriculum Requirements Overview

Week	Day	Unit	Unit Name	Subtopic	CR1	CR2	CR3	CR4	CR5	CR6	CR7
1	5	1	Karel	Intro to Programming With Karel	✓		✓	✓	✓	✓	
2	10	1	Karel	Commands, Methods, Loops, Conditionals	✓				✓	✓	
3	15	1	Karel	Classes, Top Down Design	✓				✓	✓	
4	20	2	Computer Basics	Binary, Ethics	✓					✓	✓
5	25	2	Computer Basics	How Java Works	✓					✓	
6	30	2	Java Basics	Printing, Variables, Types	✓				✓	✓	
7	35	2	Java Basics	Arithmetic Expressions, Casting	✓				✓	✓	
8	40	2	Java Basics	I/O, Errors, Math	✓				✓	✓	
9	45	2	Java Basics	Loops	✓				✓	✓	
10	50	2	Java Basics	If/Else	✓				✓	✓	
11	55	2	Java Basics	Debugging	✓				✓	✓	
12	60	2	Java Basics	Nested Control Structures	✓				✓	✓	
13	65	3	Java Basics	Strings	✓				✓	✓	
14	70	3	Methods	Methods, Parameters, Return Values	✓				✓	✓	
15	75	3	Methods	Methods, Parameters, Return Values	✓					✓	
16	80	3	Methods	Methods, Parameters, Return Values	✓					✓	
17	85	4	Classes and OOP	What is a class?	✓				✓	✓	
18	90	4	Classes and OOP	Using Classes	✓				✓	✓	

Week	Day	Unit	Unit Name	Subtopic	CR1	CR2	CR3	CR4	CR5	CR6	CR7
19	95	4	Classes and OOP	Writing our own classes	✓				✓	✓	
20	100	4	Classes and OOP	Methods, instance variables, constructors	✓				✓	✓	
21	105	4	Classes and OOP	visibility, static, this, super	✓				✓	✓	
22	110	4	Classes and OOP	Designing Classes	✓					✓	
23	115	4	Classes and OOP	Designing Classes	✓					✓	
24	120	5	Files	File Reading/Writing	✓				✓	✓	
25	125	5	Files	File Reading/Writing	✓					✓	
26	130	6	Arrays	Basic 1D arrays	✓				✓	✓	
27	135	6	ArrayList	Using ArrayList class	✓	✓			✓	✓	
28	140	6	ArrayList	Using ArrayList class	✓	✓			✓	✓	
29	145	6	2D Arrays	Basic 2D arrays	✓	✓			✓	✓	
30	150	7	Searching and Sorting	Sequential, binary, selection, insertion, mergesort	✓	✓			✓	✓	
31	155	7	Inheritance and Interfaces, Polymorphism	Advanced use of classes	✓				✓	✓	
32	160	7	Recursion	Basic recursion	✓					✓	
33	165	8	AP Test Review	Review for AP Test/ Large Project	✓					✓	
34	170	8	AP Test Review	Review for AP Test/ Large Project	✓					✓	
35	175	8	AP Test Review	Review for AP Test/ Large Project	✓					✓	
36	180	8	AP Test Review	Review for AP Test/ Large Project	✓					✓	
37	185	8	Final Project	Students design and carry out a final summative project	✓	✓	✓	✓	✓	✓	