AP Computer Science A (Java) Scope and Sequence

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 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 curriculum has been pre-approved by College Board's AP Course Audit as meeting or exceeding the curricular expectations colleges and universities have for this subject.

Module 1: Introduction to Programming with Karel the Dog	
15 hours (3 weeks)	Students learn the basics of Java commands, control structures, and problem solving by solving puzzles with Karel.
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

Module 2: Basic Java	
45 hours (9 weeks)	Learn the basics of the Java programming language. This unit covers printing, variables, types, as well as how to use the basic control structures in the Java language.
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR5** The course teaches students to use elements of the standard Java library from the AP Java subset in Appendix A of the AP Computer Science A Course Description. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

CR7 The course teaches students to recognize the ethical and social implications of computer use.

Module 3: Methods	
15 hours (3 weeks)	Methods are segments of code that perform a specific task. This module teaches you how to define methods in your programs and uses the autograder to test if your methods are working correctly.
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR5** The course teaches students to use elements of the standard Java library from the AP Java subset in Appendix A of the AP Computer Science A Course Description. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

Module 4: Classes and Object-Oriented Programming	
30 hours (6 weeks)	This unit teaches students the basics of Object-Oriented Programming in Java, which is a powerful programming paradigm. Students will learn how objects store data and interact with each other in Java programs. Students will design and implement classes and extend classes using inheritance.
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR4** The course teaches students to code fluently in an object-oriented paradigm using the programming language Java. **CR5** The course teaches students to use elements of the standard Java library from the AP Java subset in Appendix A of the AP Computer Science A Course Description. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

Module 5: Data Structures	
30 hours (6 weeks)	This module introduces basic data structures in Java including arrays, ArrayLists, 2 dimensional arrays, and HashMaps. Data structures will be used to design larger applications.

College Board Curriculum Requirements Addressed

CR1 The course teaches students to design and implement computer-based solutions to problems.

CR2b The course teaches students to use commonly used data structures.

CR3 The course teaches students to select appropriate algorithms and data structures to solve problems.

CR4 The course teaches students to code fluently in an object-oriented paradigm using the programming language Java.

CR5 The course teaches students to use elements of the standard Java library from the AP Java subset in Appendix A of the AP Computer Science A Course Description.

CR6 The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.

Module 6: Algorithms and Recursion	
15 hours (3 weeks)	In this module, students will be introduced to fundamental searching and sorting algorithms including sequential search, binary search, insertion sort, selection sort, and mergesort. Recursion is also introduced.

College Board Curriculum Requirements Addressed

CR1 The course teaches students to design and implement computer-based solutions to problems.

CR2a The course teaches students to use and implement commonly used algorithms.

CR3 The course teaches students to select appropriate algorithms and data structures to solve problems.

CR5 The course teaches students to use elements of the standard Java library from the AP Java subset in Appendix A of the AP Computer Science A Course Description.

CR6 The course includes a structured lab component comprised of a minimum of 20 hours of

hands-on lab experiences.

Module 7: AP Test Practice	
15 hours (3 weeks)	This module provides a practice test in the same format as the AP Computer Science in Java exam.
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

Module 8: Final Project	
15 hours (3 weeks)	This final project allows students to combine a variety of topics in a single application, utilizing skills learned throughout the course
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems. **CR4** The course teaches students to code fluently in an object-oriented paradigm using the programming language Java. **CR6** The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.	

Module 9: Optional Supplemental Materials	
N/A	Practice AP CS A concepts including string processing, recursion, designing classes, arrays and arraylists, searching and sort algorithms, and more!
College Board Curriculum Requirements Addressed **CR1** The course teaches students to design and implement computer-based solutions to problems.	

CR4 The course teaches students to code fluently in an object-oriented paradigm using the programming language Java.

CR6 The course includes a structured lab component comprised of a minimum of 20 hours of hands-on lab experiences.

CR7 The course teaches students to recognize the ethical and social implications of computer use.