

West Jefferson Hills School District
CURRICULUM STRANDS -
AP COMPUTER SCIENCE – Java

I. Understand the topics covered in structured programming

- A. Get an overview of the main hardware components and terms:
- B. Learn about creating an Applet
- C. Understand the concept of writing a program
- D. Learn about classes and objects and how they are created.
- E. Understand Data Types, Variables, Arithmetic and Java Syntax
- F. Learn about Boolean Expressions and Selection Statements
- G. Understand how the loops works
- H. Understand Strings and immutability of a String

II. Implement and understand the concept of an Array and Two Dimensional Array.

- A. Learn to declare an Array
- B. Learn to find an Array length
- C. Learn to declare a two-dimensional Array
- D. Learn to find a two-dimensional Array length

III. Use Searching techniques and Sorting techniques in an Array

- A. Understand the concept of a Sequential Search
- B. Implement a Binary Search on an Array
- C. Learn how to create a Selection Sort
- D. Learn how to create an Insertion Sort
- E. Implement a Merge Sort on an Array
- F. Apply the Quick Sort on an Array

IV. Streams and Files

- A. Learn how to inputting from a file
- B. Learn how to outputting to a file

V. Classes and Interface

- A. Understand the concept of inheritance
- B. Learn how to extend a class
- C. Learn Sub-class and Super-class
- D. Understand Polymorphism
- E. Apply encapsulation to a class

VI. Case Study

- A. Run Case study programs
- B. Analysis Case Study code
- C. Change Case Study code

VII. Lists and Iterators

- A. Understand the concept of List Interface
- B. Create a Linked List
- C. Apply traversals to a linked-list and use iterators

VIII. Stacks and Queues

- A. Understand how to implement a Stack
- B. Understand how to implement Queues

IX. ArrayList

- A. Able to create an ArrayList
- B. Understand how to arrange an ArrayList
- C. Use methods of an ArrayList

X. Recursion

- A. Understand the concept of Recursion
- B. Know what a terminating case of a Recursion is.
- C. Apply recursion to a program

XI. Binary Tree

- A. How to implement a Binary Tree.
- B. Able to Transverse a binary tree.
- C. Use Binary Search Trees

XII. Tables and Hashing

- A. Creating a Hashing Tables

XIII. Priority Queues

- A. Learn about Priority Queues Interface
- B. Create Binary Trees Non-linked Representation
- C. Analysis Heaps and Priority Queues.

XIV. Analysis of Algorithms

- A. Understand the concept of Big-O Notation
- B. Analysis Sorting Big-O speed