



Java™

PROGRAMMING

Get Started with Java Programming

Taught by Samuel and Maria

The course will begin with basic programming concepts and cover fundamentals of Object Oriented Programming and Data Structures. No prior programming knowledge is required. Each of the classes will rely on plenty of hands-on coding exercises to help understand the concepts.

Course Outline

Introduction to Java Programming

Object Oriented Programming Concepts

Data Structures and Algorithms

Searching and Sorting

SCHEDULE

Start:

End:

Time:

Mode: Zoom

Course objective:

Provide an introduction to Java programming, Object oriented programming concepts, data structures and algorithms through hands-on coding. At the end of this class, participants will be comfortable to take advanced Computer Science classes or learn advanced java and other programming languages on their own.

Target Audience:

Students entering 8th grade and above. No prior programming knowledge required, but familiarity with a programming language will be an added advantage

Class Format:

5 sessions, each 3 hours

Instructors:

- Samuel [Bellarmine College Prep]
- Maria [Harker High School]

Curriculum:

- **Day 1**
 - Introductions + Icebreakers
 - Anatomy of a Computer Program
 - Methods
 - Statements
 - Comments
 - How a Computer Program Runs
 - Command Demonstration
 - Execution Flow
 - Why Java is significant?
 - Most common places Java programming is used
 - Lab
 - First Java Program: Hello World
 - Class Definition
 - Variations
 - Challenge
 - Input/Output + Syntax
 - Overview of Basic Data Types + Operators
 - Integer
 - Float
 - Boolean
 - Character
 - Variables
 - Introduction to Strings
 - Conditionals
 - Lab Work
- **Day 2**
 - Review of Previous Class
 - String Operations
 - (.substring() .length() .equalsTo(), etc...)

- Intro to Codingbat (Strings)
- Introduction to Loops
 - For
 - While
- Introduction to Arrays
 - Array Methods
 - Advantages and Disadvantages
 - A real world example
- Codingbat (arrays) + Lab Work

- **Day 3**
 - Introduction to Classes and Objects
 - Object-oriented Concepts
 - Public/private
 - Methods
 - A real world object example
 - Strings
 - Review of Previous Class (Classes and Objects)
 - ArrayLists (example object)
 - Comparison to Arrays
 - Fixed size vs changeable size
 - Methods
 - Real World Use of ArrayLists
 - Lab Work

- **Day 4**
 - Object Oriented Programming
 - Inheritance
 - Abstract Classes
 - Interfaces
 - Polymorphism
 - Encapsulation
 - Introduction to Data Structures and Algorithms
 - Introduction to Sorting and Searching
 - Searching
 - Linear Search
 - Binary Search
 - Lab Work

- **Day 5**
 - Sorting
 - Bubble Sort
 - Insertion Sort
 - Review
 - Lab Work
 - Final Project

Needed downloads:

1. **Java (JDK 1.8)**
2. **JGrasp**
3. **Zoom Video Conferencing App**

Computer Needs:

1. Windows or Mac computer with internet
2. Google account (Sharing course materials, assignments and using Google classroom)

External Resources and Websites:

1. Kahoot.it: <https://create.kahoot.it/>
2. Java Tutorials: <https://docs.oracle.com/javase/tutorial>
3. Codingbat: <https://codingbat.com/java/String-1>