Java Programming Course Outline

Core Java Standard Edition

Comprehensive outline for a Java programming course for beginners. This outline covers the fundamental concepts and gradually progresses to more advanced topics. This course is adjusted with the pacing and depth of students understanding based on the duration of the course and the students' background.

Java Programming Course Outline for Beginners

Module 1: Introduction to Java

- What is Java?
- Java's key features and benefits
- Setting up Java development environment (IDE, JDK)
- Writing your first "Hello, World!" program
- Understanding the basic structure of a Java program

Module 2: Variables and Data Types

- Variables, data types, and identifiers
- Primitive data types (int, double, char, boolean)
- Working with strings
- Type conversion and casting
- Introduction to Java's wrapper classes

Module 3: Control Flow Statements

- Conditional statements (if, else if, else)
- Switch statements
- Looping structures (for, while, do-while)
- Break and continue statements
- Nested loops and loop control

Module 4: Methods and Functions

- Defining and calling methods
- Method parameters and return types
- Method overloading
- Scope and lifetime of variables
- Introduction to recursion

Module 5: Arrays and Collections

- Introduction to arrays
- Creating and manipulating arrays
- Introduction to ArrayLists
- Working with collections (List, Set, Map)
- Iterating through collections using loops and iterators

Module 6: Object-Oriented Programming Basics

- Introduction to OOP concepts (classes, objects, inheritance, polymorphism, encapsulation, abstraction)
- Defining classes and creating objects
- Constructors and methods in classes
- Access modifiers (public, private, protected)

Module 7: Inheritance and Polymorphism

- Inheriting classes and superclass/subclass relationships
- Use of Interface in Java
- Method overriding
- Abstract classes and methods
- Using **super** keyword
- Polymorphism and dynamic binding

Module 8: Exception Handling

- Understanding exceptions
- Using try-catch blocks
- Handling multiple exceptions

- Throwing exceptions
- Using the **finally** block

Module 9: Basic Data Structures and Algorithms

- Introduction to basic data structure stacks and queues
- Introduction to linked lists
- Searching and sorting algorithms (linear search, binary search, bubble sort, selection sort)

Module 10: File Handling

- Reading and writing text files
- Working with streams (FileInputStream, FileOutputStream)
- Handling exceptions in file I/O
- Introduction to character streams (FileReader, FileWriter)

Module 11: Introduction to Java Enterprise Application Framework

- Overview of Java application framework.
- Understanding MVC applications
- Understanding of Spring Java Application Framework
- Understanding of Spring Boot

Module 12: Project and Practical Applications

- Guided project to apply learned concepts
- Using Java in real-world scenarios (e.g., simple apps, utilities)

This outline provides a solid foundation for the beginners' Java programming course. This outline is adjusted to incorporate plenty of practice exercises, coding challenges, and hands-on projects to reinforce the concepts. Additionally, it tries to tailor the content and pace to match the students' learning curve and prior experience.

*** This course outline is tentative thus may change based on course duration and student’s java expertise level