

# JAVA SYLLABUS

## Module 1: Introduction to Java

- History and features of Java
- Java Architecture (JVM, JRE, JDK)
- Installing JDK and setting environment
- Structure of a Java program
- First Java program
- Compilation and execution process

## Module 2: Data Types & Variables

- Primitive data types (int, float, double, char, boolean)
- Variables and constants
- Type casting
- Operators (arithmetic, relational, logical, assignment)

## Module 3: Control Statements

- if, if-else, nested if
- switch-case
- Conditional (ternary) operator
- Decision-making programs

## Module 4: Loops

- for loop
- while loop
- do-while loop
- Nested loops
- break and continue

## **Module 5: Methods**

- Method declaration and definition
- Parameter passing
- Method overloading
- Recursion
- Static methods

## **Module 6: Arrays**

- One-dimensional arrays
- Multi-dimensional arrays
- Array operations
- Passing arrays to methods

## **Module 7: Strings**

- String class
- String methods
- StringBuffer & StringBuilder
- String manipulation

## **Module 8: Object-Oriented Programming (OOP)**

- Classes and Objects
- Constructors & Destructors
- Access modifiers
- Encapsulation

## **Module 9: Advanced OOP Concepts**

- Inheritance
- Polymorphism (Overloading & Overriding)
- Abstraction
- Interfaces

- Packages

## Module 10: Exception Handling

- try, catch, finally
- throw and throws
- Custom exceptions
- Error handling best practices

## Module 11: Multithreading

- Introduction to Threads
- Thread lifecycle
- Creating threads
- Synchronization
- Thread communication

## Module 12: Collections Framework

- List, Set, Map interfaces
- ArrayList, LinkedList, HashSet, HashMap
- Iterators
- Sorting and searching

## Module 13: File Handling & I/O

- File class
- Input/Output streams
- Reading and writing files
- Serialization

## Module 14: JDBC (Database Connectivity)

- Introduction to JDBC
- Connecting Java with database

- CRUD operations
- Prepared statements

## Module 15: GUI Development (Swing/JavaFX)

- Introduction to GUI
- Creating forms
- Event handling
- Layout managers

## Module 16: Introduction to Web Development

- Basics of Servlets
- Introduction to JSP
- MVC architecture overview

## Module 17: Build Tools & Version Control

- Introduction to Maven/Gradle
- Dependency management
- Git basics

## Module 18: Real-World Projects

- Console-based applications
- Student Management System
- Database-driven application
- Mini web project