# fundamental of java – Syllabus

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1. \*\*Week 1:\*\*  
 \* 📚 Introduction to Java, Setting up the Environment  
 \* 🔍 JDK installation, IDE (IntelliJ/Eclipse), basic syntax, "Hello, World!" program, comments, data types (primitives).  
 \* 🎯 Lab: Setting up development environment and writing a simple program.  
  
  
2. \*\*Week 2:\*\*  
 \* 📚 Variables, Operators, Control Flow  
 \* 🔍 Variable declaration, assignment, arithmetic, relational, logical operators, if-else statements, switch statements.  
 \* 🎯 Quiz: Basic syntax and operators.  
  
  
3. \*\*Week 3:\*\*  
 \* 📚 Loops and Iteration  
 \* 🔍 `for`, `while`, `do-while` loops, nested loops, break and continue statements.  
 \* 🎯 Lab: Solving problems using loops (e.g., factorial calculation, Fibonacci sequence).  
  
  
4. \*\*Week 4:\*\*  
 \* 📚 Introduction to Arrays  
 \* 🔍 Array declaration, initialization, accessing elements, array length, iterating through arrays.  
 \* 🎯 Lab: Array manipulation exercises (e.g., finding min/max, sum of elements).  
  
  
5. \*\*Week 5:\*\*  
 \* 📚 Multidimensional Arrays  
 \* 🔍 Declaring, initializing, and traversing 2D arrays, matrix operations (addition, multiplication).  
 \* 🎯 Lab: Working with 2D arrays (e.g., creating a matrix, performing operations).  
  
  
6. \*\*Week 6:\*\*  
 \* 📚 Methods and Functions  
 \* 🔍 Defining and calling methods, method parameters, return types, method overloading.  
 \* 🎯 Quiz: Arrays and methods.  
  
  
7. \*\*Week 7:\*\*  
 \* 📚 Introduction to Object-Oriented Programming (OOP) Concepts  
 \* 🔍 Classes and objects, encapsulation, constructors.  
 \* 🎯 Lab: Creating simple classes and objects.  
  
  
8. \*\*Week 8:\*\*  
 \* 📚 Inheritance  
 \* 🔍 Extending classes, superclass and subclass, method overriding, polymorphism.  
 \* 🎯 Lab: Implementing inheritance in a program.  
  
  
9. \*\*Week 9:\*\*  
 \* 📚 Polymorphism and Abstraction  
 \* 🔍 Abstract classes, interfaces, method overriding, runtime polymorphism.  
 \* 🎯 Group Discussion: Advantages and disadvantages of inheritance and polymorphism.  
  
  
10. \*\*Week 10:\*\*  
 \* 📚 Encapsulation and Data Hiding  
 \* 🔍 Access modifiers (public, private, protected), getters and setters.  
 \* 🎯 Lab: Implementing encapsulation in a program.  
  
  
11. \*\*Week 11:\*\*  
 \* 📚 Advanced Array Manipulation  
 \* 🔍 Searching algorithms (linear, binary search), sorting algorithms (bubble sort, selection sort).  
 \* 🎯 Lab: Implementing and comparing different sorting and searching algorithms.  
  
  
12. \*\*Week 12:\*\*  
 \* 📚 Exception Handling  
 \* 🔍 `try-catch` blocks, `finally` block, types of exceptions.  
 \* 🎯 Lab: Handling exceptions in a program.  
  
  
13. \*\*Week 13:\*\*  
 \* 📚 Strings and String Manipulation  
 \* 🔍 String methods, string immutability, StringBuilder.  
 \* 🎯 Quiz: Exception Handling and String Manipulation  
  
  
14. \*\*Week 14:\*\*  
 \* 📚 Introduction to Input/Output (I/O)  
 \* 🔍 Reading from console, writing to files.  
 \* 🎯 Lab: File I/O operations.  
  
  
15. \*\*Week 15:\*\*  
 \* 📚 Review and Project Presentation  
 \* 🔍 Comprehensive review of all topics, student project presentations.  
 \* 🎯 Project: A larger program utilizing multiple concepts learned throughout the course (e.g., array-based game, data processing application).

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