

# Java Learning Roadmap

## ★ Phase 1: Basics of Java (Beginner)

1. Introduction to Java
    - Features, JDK, JRE, JVM
    - First program (Hello World)
  2. Data Types & Variables
  3. Operators (Arithmetic, Relational, Logical, etc.)
  4. Input/Output (Scanner, System.in/out)
  5. Control Statements
    - if, if-else, switch
    - Loops (for, while, do-while)
    - break, continue, return
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## ★ Phase 2: Object-Oriented Programming (Core Java)

6. Classes and Objects
  7. Constructors
  8. this & static keyword
  9. Encapsulation (Getters & Setters)
  10. Inheritance (extends, super)
  11. Polymorphism
    - Method Overloading
    - Method Overriding
  12. Abstraction (abstract class, interface)
  13. Final keyword (variable, method, class)
  14. Access Modifiers (public, private, protected, default)
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## ★ Phase 3: Arrays & Strings

15. 1D & 2D Arrays
  16. Array methods (sorting, searching)
  17. String class & methods
  18. StringBuffer & StringBuilder
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## ★ Phase 4: Exception Handling

19. try, catch, finally

- 20. throw, throws
  - 21. Checked vs Unchecked Exceptions
  - 22. Custom Exceptions
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## ✦ Phase 5: Collections Framework

- 23. List (ArrayList, LinkedList, Vector)
  - 24. Set (HashSet, TreeSet, LinkedHashSet)
  - 25. Map (HashMap, TreeMap, LinkedHashMap, Hashtable)
  - 26. Iterators & ListIterator
  - 27. Collections utility class
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## ✦ Phase 6: Advanced Core Java

- 28. Inner Classes (static, non-static, anonymous)
  - 29. Enums
  - 30. Wrapper Classes & Autoboxing/Unboxing
  - 31. Generics
  - 32. File Handling (FileReader, FileWriter, Serialization)
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## ✦ Phase 7: Multithreading & Concurrency

- 33. Thread class & Runnable interface
  - 34. Thread lifecycle
  - 35. Synchronization
  - 36. Executor framework
  - 37. Concurrent collections
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## ✦ Phase 8: Java 8+ Features

- 38. Lambda Expressions
  - 39. Functional Interfaces (Predicate, Consumer, Supplier, Function)
  - 40. Streams API
  - 41. Method References
  - 42. Optional Class
  - 43. Default & Static methods in Interfaces
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## ✦ Phase 9: Databases & Java

- 44. JDBC (Java Database Connectivity)
  - 45. Statement & PreparedStatement
  - 46. Transactions
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## ★ Phase 10: Enterprise Java (JEE)

- 47. Servlets
  - 48. JSP (Java Server Pages)
  - 49. MVC architecture basics
  - 50. Hibernate (ORM)
  - 51. Spring & Spring Boot (most popular)
  - 52. RESTful Web Services
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## ★ Phase 11: Optional (Extras if you want)

- JavaFX / Swing (GUI apps)
  - Microservices with Spring Boot
  - Cloud + Java (AWS, Docker, Kubernetes)
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## ✓ Learning Strategy:

- **Beginner to Core Java (Phase 1–4)** → You'll be able to solve programs & small projects.
- **Collections + File Handling (Phase 5–6)** → You'll be job-ready for basic coding interviews.
- **Multithreading + Java 8 (Phase 7–8)** → You'll reach intermediate/advanced developer level.
- **JDBC + JEE (Phase 9–10)** → You'll be ready for web apps & full-stack Java development.