

Advanced Java Course Catalog – 90 Days

Day	Module	Topics Covered
1-3	Java Fundamentals Refresher	Java Basics, Object-Oriented Programming (OOP) Concepts, Classes and Objects, Inheritance, Polymorphism, Encapsulation, Abstraction
4-6	Exception Handling in Java	Types of Exceptions (Checked and Unchecked), Try-Catch-Finally, Throw and Throws, Custom Exceptions, Exception Propagation
7-9	Java Collections Framework	Introduction to Collections, List, Set, Queue, Map, Iterators, Comparator, Comparable, Collection Interfaces
10-12	Java Generics	Introduction to Generics, Creating Generic Classes and Methods, Bounded Types, Wildcards, Type Safety with Generics
13-15	Multithreading and Concurrency	Introduction to Multithreading, Thread Class and Runnable Interface, Synchronization, Deadlock, Thread Pools, Executor Framework
16-18	Java I/O (Input/Output)	File Handling in Java, Streams (Byte and Character), Buffered Streams, FileReader, FileWriter, Serialization and Deserialization
19-21	Java NIO (New I/O)	NIO Overview, Channels and Buffers, Path Class, File I/O with NIO, Asynchronous I/O, File System API
22-24	Java Networking	Introduction to Networking in Java, Socket Programming, URL Processing, HTTP, ServerSocket, Client-Server Architecture
25-27	Java Reflection API	Introduction to Reflection, Class and Method Reflection, Annotations, Dynamic Class Loading, Reflection Best Practices
28-30	Java Database Connectivity (JDBC)	Introduction to JDBC, JDBC API Overview, Connecting to Databases, Executing SQL Queries, ResultSet, PreparedStatement, Transactions
31-33	Spring Framework Overview	Introduction to Spring, Dependency Injection (DI), Spring Beans, ApplicationContext, Spring Annotations, Spring Bean Lifecycle
34-36	Spring Core and AOP (Aspect-Oriented Programming)	Spring AOP Overview, Aspect-Oriented Programming Concepts, Spring AOP Implementations, AspectJ Integration, Cross-Cutting Concerns
37-39	Spring Boot	Introduction to Spring Boot, Setting up Spring Boot Projects, Spring Boot Annotations, Auto Configuration, Embedded Servers (Tomcat, Jetty)
40-42	Spring Data and JPA (Java Persistence API)	Introduction to Spring Data JPA, ORM Concepts, Entity Mapping, Repository Pattern, Query Methods, Spring Data Integration

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43-45	Spring Security	Introduction to Spring Security, Authentication and Authorization, Configuring Spring Security, Role-Based Access Control (RBAC), JWT Authentication
46-48	Spring MVC (Model View Controller)	Spring MVC Architecture, Controllers, Views (JSP, Thymeleaf), Request Mapping, Handling Forms, Data Binding, Spring Validation
49-51	RESTful Web Services with Spring	Introduction to RESTful Web Services, REST Principles, Creating REST APIs with Spring Boot, REST Annotations (GET, POST, PUT, DELETE), Consuming APIs
52-54	Spring Cloud	Introduction to Microservices, Spring Cloud Overview, Spring Cloud Config, Service Discovery with Eureka, Spring Cloud Gateway, Circuit Breaker (Hystrix)
55-57	Spring Batch	Introduction to Spring Batch, Batch Processing Concepts, Jobs, Steps, ItemReader, ItemProcessor, ItemWriter, Chunk-Oriented Processing
58-60	Java 8 Features – Lambda Expressions	Introduction to Java 8, Lambda Expressions, Functional Interfaces, Streams API, Method References, Default Methods
61-63	Java Streams and Optional	Streams API, Stream Operations (Filter, Map, Reduce), Collectors, Optional Class, Working with Null Values in Java 8
64-66	Java 8 Date and Time API	Introduction to Java Time API, LocalDate, LocalTime, LocalDateTime, ZonedDateTime, Formatting and Parsing Dates
67-69	Java Design Patterns	Introduction to Design Patterns, Creational Patterns (Singleton, Factory, Abstract Factory), Structural Patterns (Decorator, Adapter, Proxy), Behavioral Patterns (Strategy, Observer, Command)
70-72	Java Microservices Architecture	Introduction to Microservices, Microservices vs Monolithic Architecture, Building Microservices with Spring Boot, Spring Cloud Integration
73-75	Message Queues and Asynchronous Programming	Introduction to Message Queues, JMS (Java Message Service), RabbitMQ, Kafka Integration, Asynchronous Programming in Java
76-78	Testing in Java with JUnit and Mockito	Introduction to JUnit, Writing Unit Tests, Test-Driven Development (TDD), Mockito for Mocking Dependencies, Unit Testing Spring Applications
79-81	Java Logging and Monitoring	Logging in Java, SLF4J and Logback, Log4j Configuration, Log Aggregation, Monitoring with Prometheus and Grafana
82-84	Java for Cloud Computing	Java Cloud-Native Applications, Deployment to AWS, Azure, Google Cloud, Working with Cloud Databases, Cloud Storage Integration

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85- 87	Building Scalable Applications with Java	Performance Optimization Techniques, Memory Management, Garbage Collection, Thread Safety, Load Balancing, Caching Strategies
88- 90	Capstone Project & Final Exam	Final Hands-on Project (Building a Real-world Java Application with Spring Boot), Review of Key Concepts, Final Exam, Certification of Completion