Week 1: Introduction to Java

- Overview of Java
- Setting up the Java environment
- Writing your first Java program

Week 2: Java Basics

- Java syntax and language fundamentals
- Basic control flow statements (if-else, loops, switch)
- Basic data types (primitive and non-primitive)

Week 3: Object-Oriented Programming with Java

- Object-oriented programming concepts (classes, objects, inheritance, polymorphism)
- Encapsulation, abstraction, and information hiding
- Interfaces and abstract classes

Week 4: Java Collections Framework

- Overview of the Java Collections Framework
- Common collection types (lists, sets, maps)
- Collection algorithms and iteration

Week 5: Exception Handling

- Handling exceptions in Java
- Throwing and catching exceptions
- Best practices for exception handling

Week 6: File I/O and Serialization

- Reading and writing files in Java
- Serialization and deserialization of Java objects
- Working with different file formats (e.g., CSV, XML, JSON)

Week 7: Multithreading in Java

- Overview of multithreading in Java
- Creating and running threads
- Synchronization and thread safety

Week 8: Networking in Java

- Overview of networking in Java
- Working with sockets and streams
- Writing client-server applications

Week 9: Java Servlets and JSP

- Overview of Java servlets and JavaServer Pages (JSP)
- Creating dynamic web pages with JSP
- Handling user input and form submissions

Week 10: Java Frameworks

- Overview of popular Java frameworks (e.g., Spring, Hibernate)
- Understanding the benefits and drawbacks of frameworks

- Creating web applications with Spring MVC

Week 11: GUI Development with JavaFX

- Overview of JavaFX
- Creating graphical user interfaces (GUIs) with JavaFX
- Working with common GUI components (e.g., buttons, labels, tables)

Week 12: JDBC and Database Connectivity

- Overview of JDBC (Java Database Connectivity)
- Connecting to databases with JDBC
- Executing SQL queries and updating database records

Week 13: Advanced Java Concepts

- Advanced object-oriented programming concepts (generics, inner classes, lambda expressions)
- Reflection and introspection
- Metaprogramming with annotations

Week 14: Web Services with Java

- Overview of web services (SOAP, REST)
- Writing web services with Java
- Consuming web services with Java

Week 15: Testing in Java

- Overview of testing frameworks (JUnit, TestNG)
- Writing unit tests in Java
- Test-driven development (TDD) in Java

Week 16: Java Security

- Common Java security vulnerabilities (e.g., injection attacks, cross-site scripting)
- Best practices for securing Java applications
- Cryptography and secure coding practices

Week 17: Java Performance Tuning

- Overview of Java performance tuning
- Identifying and diagnosing performance issues
- Optimizing Java code for performance

Week 18: Java Deployment and Management

- Overview of Java deployment options (e.g., JAR files, Java Web Start)
- Deploying Java applications to web servers and application servers
- Managing Java applications in production environments

Week 19: Java 9+ Features

- New features in Java 9 and later releases (e.g., modules, JShell)
- Understanding and working with new Java features

Week 20: Java Trends and Best Practices

- Emerging trends in the Java ecosystem
- Best practices for Java development
- Staying up-to-date with