

Java Full Stack Course content

Core Java (J2SE) (Java 2 Standard Edition)

1) Java Introduction.

- ❖ Small History of Java.
- ❖ Why we need to Learn Java, What is Java and Where we are using it in Real Time.
- ❖ Java Terminologies and explanation.
- ❖ JDK Download and Installation and Setup for Programming.
- ❖ Write a Simple Java Program using Notepad++ and cmd prompt with detailed Explanation.
- ❖ Eclipse Download, Installation and Setup.
- ❖ Write a Simple Program using Eclipse with creating a workspace, project and Package with classes.
- ❖ JVM Architecture with Diagrammatic and Programming Explanation.

2) Language Fundamentals.

- ❖ What are the Identifiers and Rules for it?
- ❖ 50 Java Keywords with Explanation.
- ❖ What are the Different data types in Java?
- ❖ What are the Literals in Java ?
- ❖ What Exactly Arrays and Why we need to Learn Arrays with 15+ Examples.
- ❖ Types of variables.
- ❖ Var arg methods.
- ❖ main(String[] args) method with command line arguments and Java Coding standards.
- ❖ Java Constructors.

3) Access Modifiers.

- ❖ private, protected, undefined(default) and public with Programmatic Examples.
- ❖ static, strictfp, synchronized and abstract with Programmatic Examples.
- ❖ final, transient, volatile and native with programmatic examples.

4) Object Oriented Programming Concepts.

- ❖ Why we need to learn Oops Concepts.
- ❖ What Exactly the Oops Concepts ?
- ❖ Where are we using Oops Concepts in real time ?
- ❖ Encapsulation with examples of demo programming.
- ❖ Abstraction with examples of demo programming.
- ❖ Inheritance with examples of demo programming.
- ❖ Polymorphism with examples of demo programming.

5) Logical Statements.

- ❖ All logical statements like if, else, for, while, do, switch, case, continue, break and default with 10+ Examples.

6) Exception Handling

- ❖ Exception Handling Introduction.
- ❖ Explain the Throwable from java.lang package.
- ❖ Explain the differences between Exception and Error.
- ❖ Explain the differences between Checked Exceptions and Unchecked Exceptions.
- ❖ Explain the try,catch,finally,throw and throws with 10+ example programs .
- ❖ Customized Exception with 2+ example programs.

7) String Handling

- ❖ String Handling Introduction.
- ❖ Differences between String Literals and String Objects.
- ❖ String methods with 15+ practical programs.
- ❖ Differences between String, StringBuffer and StringBuilder.
- ❖ 10+ Interview Programs on String Handling.

8) File IO

- ❖ File Introduction.
- ❖ Explain the File, FileWriter, FileReader, BufferedWriter, BufferedReader and PrintWriter with 7+ example Programs.
- ❖ Explain Serialization and DeSerialization with example Programming.

9) Multithreading

- ❖ MultiThreading Introduction.
- ❖ What exactly is the Thread Scheduler?
- ❖ Difference between t.start() and t.run().
- ❖ Importance of Thread class start().
- ❖ Overloading of run() method.
- ❖ If we are not overriding the run() method.
- ❖ Overriding the start() method.
- ❖ Life Cycle of a Thread.
- ❖ Which is the best approach to define a Thread :

10) Collections framework

- ❖ Collections Introduction and why we need to learn Collections Framework.
- ❖ Differences between Collections and Arrays.
- ❖ Collections Hierarchy with detailed explanation.
- ❖ Explain the java.util packages with all interfaces and classes, almost 25+ example programs.
- ❖ Hashmap Internal Implementation.

11) Java 8 features

- ❖ Lambda Expressions.
- ❖ Functional Interfaces (FI).
- ❖ Functional Interfaces wrt Inheritance.
- ❖ LambdaExpression with the FI.
- ❖ LambdaExpression vs MultiThreading.
- ❖ LambdaExpression vs Collections.
- ❖ Anonymous Inner class vs Lambda Expression.
- ❖ Default methods and static methods.
- ❖ Predefined Functional Interfaces.
- ❖ Double colon Operator (::) - Method reference, Constructor Reference
- ❖ Streams API
- ❖ Date and Time API
- ❖ Optional Class
- ❖ Nashorn JavaScript Engine

12) Java 11 and 17 features.

13) Design patterns

- ❖ Singleton Patterns.
- ❖ Factory Pattern and Abstract Factory Pattern.
- ❖ Builder Pattern
- ❖ Prototype Design Pattern.

Advanced java : (J2EE : Servlets and JSP)

Servlets	JSP
<ul style="list-style-type: none"> ❖ Introduction to Web ❖ MVC Introduction ❖ Web - Port, HTTP, Get, Post, Container, Web vs Application Server. ❖ Client Server Architecture. ❖ Deployment Descriptor. ❖ HTML Pages ❖ Content Type MIME Types. ❖ Introduction to Servlet ❖ GenericServlet, HttpServlet and Servlet Life Cycle ❖ Creation of model ❖ Getters and Setters ❖ Reflection API ❖ Storing and Manipulation with DB, SQL Injection ❖ Statements vs Prepared Statements and ResultSet ❖ Servlet API (Javax and Jakarta) ❖ How a Servlet application work ❖ Servlet Life cycle. ❖ Tomcat Server Download and install for Web Application Deployment. ❖ Steps to Create Servlet using Tomcat Server. ❖ Creating First Servlet Application using Eclipse IDE. 	<ul style="list-style-type: none"> ❖ JSP Life Cycle — Introduction, Phases, Methods ❖ Run JSP Program — How to Run JSP Program on Tomcat Server in Eclipse ❖ JSP Elements — JSP Declaration, JSP Syntax, JSP Expression, JSP Comments ❖ JSP Directives — Page, Include & Taglib Tutorial ❖ JSP Implicit Objects. ❖ JSP Standard Action Tags — include, useBean, forward, param ❖ What is Expression Language (EL)? — JSP Expression Language (EL) ❖ Exception Handling in JSP — Try Catch ❖ MVC Architecture in JSP — Learn with Example ❖ JSTL (JSP Standard Tag Library) Tutorial — Core & Custom Tags Examples ❖ JSP Action elements — client request, server response, HTTP status codes ❖ Cookies in JSP — Learn with Example ❖ JSP Form Processing — JSP Form Processing Using getParameter() ❖ JSP Filters — Web.xml Filter Mapping in JSP Servlet ❖ JSP Date Handling — JSP Current Date and Time ❖ JSP Database Connection — Select, Insert, Update & Delete Example ❖ JSP Program Examples — Registration & Login Form ❖ JSP File Upload — File Upload & File Download Program Examples ❖ Servlet vs JSP — What's the Difference?

<ul style="list-style-type: none"> ❖ Request and Responses using below <ul style="list-style-type: none"> ❖ Servlet Request ❖ Servlet Response ❖ Request Dispatcher ❖ SendRedirect method ❖ ServletConfig interface ❖ ServletContext interface ❖ Session Management. <ul style="list-style-type: none"> ➤ How session work ➤ HttpSession ➤ Using Cookies ➤ By URL rewriting ➤ Using Hidden form field ❖ ServletContextEvent and ServletContextListener ❖ HttpSessionEvent and HttpSessionListener ❖ Filter API <p>Application examples</p> <ul style="list-style-type: none"> ❖ Registration form ❖ Login system ❖ Sending Email ❖ Crud Example In servlet ❖ Pagnation Example In servlet 	
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<h2>JDBC</h2>
<ul style="list-style-type: none"> ❖ What is the purpose of JDBC..? ❖ What is JDBC ? ❖ Explain about JDBC architecture ..? ❖ What is a JDBC Client ..? ❖ Explain about the JDBC API..? ❖ Explain about DriverManager..? ❖ Explain about JDBC Driver..? ❖ Explain about a JDBC Client getting connected to a database server. ❖ Loading the driver ❖ What is Connection String..? ❖ JDBC Driver ❖ How to establish the database Connection.?

Web Technologies (UI)

HTML

- | | |
|---|--|
| <ul style="list-style-type: none">❖ HTML Tags❖ HTML Document Structure❖ The <!DOCTYPE> Declaration❖ Heading Tags❖ Centering Content❖ Horizontal Lines❖ Preserve Formatting❖ Non breaking Spaces❖ HTML Elements❖ HTML Attributes❖ HTML Formatting❖ Grouping Content❖ HTML Phrase Tags❖ HTML Comments❖ HTML Images❖ HTML Tables❖ HTML Lists❖ HTML Text Links❖ HTML Blocks | <ul style="list-style-type: none">❖ Grouping HTML Elements❖ Html Background with Images❖ HTML Colors❖ HTML Fonts❖ HTML Forms❖ Text Input Controls❖ Single-line text input controls❖ Password input controls❖ Multiple-Line Text Input Controls❖ Checkbox Control❖ Radio Button Control❖ Select Box Control❖ File Upload Box❖ Button Controls❖ Hidden Form Controls❖ HTML Marquees❖ HTML Layouts❖ HTML Layouts - Using DIV, SPAN |
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CSS

- ❖ What is CSS?
- ❖ Advantages of CSS?
- ❖ Who Creates and Maintains CSS?
- ❖ CSS - Syntax
 - -The Type Selectors
 - -The Universal Selectors
 - -The Descendant Selectors
 - -The Class Selectors
 - -The ID Selectors
 - -The Child Selectors
 - -The Attribute Selectors
 - -Multiple Style Rules
 - -Grouping Selectors
- ❖ CSS - Inclusion
 - -Embedded CSS - The <style> Element
 - -Inline CSS - The style Attribute
 - -External CSS - The <link> Element
- ❖ CSS Rules Overriding
- ❖ CSS Comments
- ❖ CSS - Measurement Units
- ❖ CSS Colors - Hex Codes
- ❖ CSS Colors - Short Hex Codes
- ❖ CSS Colors - RGB Values
- ❖ CSS - Background
 - Set the Background Color
 - Set the Background Image
 - Repeat the Background Image
 - Set the Background Image Position
 - Set the Background Attachment
- ❖ CSS - Fonts
 - Set the Font Family
 - Set the Font Style
 - Set the Font Variant
 - Set the Font Weight
 - Set the Font Size
- ❖ CSS - Text
 - Set the Text Color
 - Set the Text Direction
 - Set the Space between Characters
 - Set the Space between Words
 - Set the Text Alignment
 - Decorating the Text
 - -Set the Text Cases
 - Set the White Space between Text
 - -Set the Text Shadow
- ❖ CSS - Using Images
 - The Image Border Property
 - The Image Height Property
 - The Image Width Property
- ❖ CSS - Links
- ❖ CSS - Tables
- ❖ CSS - Borders
- ❖ CSS - Margins
- ❖ CSS - Lists
- ❖ CSS - Padding
- ❖ CSS - Cursors
- ❖ CSS - Outlines
- ❖ CSS - Dimension
- ❖ CSS - Scrollbars
- ❖ CSS - Positioning
- ❖ CSS - Layers
- ❖ CSS - Pseudo Classes
- ❖ CSS - Layouts

JavaScript

- ❖ **JavaScript Introduction**
 - **How does the JavaScript Engine Works internally.?**
 - **JavaScript Hoisting.**

- ❖ **JavaScript Basics**
 - **JavaScript Literal Characters.**
 - **JavaScript Operators, Variables.**
 - **JavaScript Loop, ArrayList and Functions.**
 - **JavaScript Form Images.**
 - **JavaScript - Errors & Exceptions.**
 - **JavaScript try..catch...finally statements.**
 - **JavaScript - Form Validation.**

- ❖ **ES6 concepts**
 - **Classes.**
 - **Arrow Functions.**
 - **Variables.**
 - **Methods.**
 - **Destruction.**
 - **Modules.**

- ❖ **Java Script Advanced Concepts**
 - **Debouncing, Event Bubbling.**
 - **this context.**
 - **call vs bind vs apply.**
 - **predefined array functions.**
 - **Server Interaction with Client.**
 - **Browser APIs.**
 - **JavaScript Throttling.**

- ❖ **How NPM works and Intro ? (Node Package Manager)**
- ❖ **Briefly discussing Package.json.**

React JS

<ul style="list-style-type: none"> ❖ React Introduction. ❖ React Environment Setup. ❖ React Fundamentals. <ul style="list-style-type: none"> ➢ React JSX ➢ ReactJS Babel Introduction ➢ ReactJS Virtual DOM ➢ ReactJS ReactDOM ❖ React Components. ❖ React Lifecycle. ❖ Differences between Functional Components and Class Components. ❖ ReactJS Container and Presentational Pattern in Components. ❖ 	<ul style="list-style-type: none"> ❖ ReactJS Lists. ❖ React Forms. ❖ React Props & States. ❖ React Hooks. <ul style="list-style-type: none"> ➢ React useState Hook ➢ ReactJS useEffect Hook ➢ Context in React ❖ React Applications. ❖ Building React App with 3rd Party Components. ❖ React Router. ❖ Client Server Interaction. <ul style="list-style-type: none"> ➢ java script fetch API. ➢ Axios Library.
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JQUERY	BootStrap
<ul style="list-style-type: none"> ❖ jQuery Introduction ❖ jQuery Syntax ❖ jQuery Selectors ❖ jQuery Event Methods ❖ jQuery Effects ❖ jQuery HTML/CSS ❖ jQuery Traversing ❖ jQuery Ajax ❖ jQuery Properties 	<ul style="list-style-type: none"> ❖ Bootstrap 5 Introduction. ❖ Bootstrap 5 Containers,Grids,Text/Typography,Colors,Tables, Images,Jumbotron,Alerts,Buttons,Button Group,Cards,Dropdowns,Collapse,Navs,Navbars, tooltip and Flex. ❖ Bootstrap 5 Forms. ❖ Bootstrap 5 Grid. ❖ Bootstrap 5 Template.

Spring	
<ul style="list-style-type: none"> ❖ Spring Introduction <ul style="list-style-type: none"> ➢ Why To Learn Spring ➢ Applications of Spring ➢ Prerequisites and Maven Installation. ➢ DI (Dependency Injection) ➢ AOP ❖ Spring Framework Architecture <ul style="list-style-type: none"> ➢ Spring Core ➢ Data Access Integration ➢ Spring Web 	<ul style="list-style-type: none"> ❖ Spring Framework Setup using Eclipse IDE. ❖ Setup Spring Framework Libraries. ❖ Spring HelloWorld application. ❖ Spring IOC Containers. ❖ Spring MVC and MVC Application. ❖ Spring Annotations with Example Programs. ❖ Spring application using Hibernate or JPA.

Spring Boot	Microservices
<ul style="list-style-type: none"> ❖ Spring Boot Introduction. ❖ Spring vs Spring Boot. ❖ Spring Boot Starters. ❖ Spring Boot Autoconfiguration ❖ Spring Boot Application ❖ Spring Boot Bootstrapping. ❖ Steps to Create Spring Applications. ❖ Spring Boot Basic Applications. ❖ Spring Boot Web Applications. <ul style="list-style-type: none"> ➢ Spring Boot Web Application with JPA. ➢ Spring Boot Rest API. ➢ Spring Boot Rest API with JPA. 	<ul style="list-style-type: none"> ❖ MicroServices Introduction. ❖ What are Microservices? ❖ KeyComponents of MicroServices Architecture. ❖ MicroServices Architecture. ❖ How to Implement MicroServices in Java using Spring Boot application. ❖ Spring Boot Rest API Basic Important annotations. ❖ Spring Boot Rest API endpoints. ❖ Java Spring Boot MicroServices application communication using Rest Template.

SQL Concepts	
❖ Database, DBMS, Port and Server introduction with Installation.	
❖ Short Overview on SQL	
❖ DDL (Data Definition Language)	CREATE, DROP, ALTER, TRUNCATE, COMMENT and RENAME with Example Queries.
❖ DQL (Data Query Language)	SELECT with Example Queries.
❖ DML (Data Manipulation Language)	INSERT, UPDATE, DELETE, LOCK, CALL and EXPLAIN PLAN with example Queries.
❖ DCL (Data Control Language)	GRANT and REVOKE with example queries.
❖ Constraints	PRIMARY KEY, FOREIGN KEY, UNIQUE, NOT NULL and CHECK
❖ TCL (Transaction Control Language)	COMMIT, ROLLBACK and SAVEPOINT with example Queries.
❖ Normalization, ACID Properties	
❖ Sorting the Data	ORDER BY Clause.
❖ Filtering the Data	DISTINCT, LIMIT, FETCH and WHERE clauses.
❖ Comparison operators	(Logical Operators, AND Operators, OR Operators, BETWEEN Operator, IN Operator, LIKE Operator, IS NULL Operator, NOT Operator)
❖ Conditional Expressions	CASE condition.
❖ Joining Multiple Tables	SQL Aliases, INNER JOIN, LEFT OUTER JOIN, FULL OUTER JOIN, CROSS JOIN and SELF JOIN.
❖ Aggregate Function	AVG, COUNT , SUM, MAX and MIN.
❖ Grouping the Data	GROUP BY, HAVING and GROUPING SETS, ROLLUP and CUBE.
❖ SET Operators	UNION and UNION ALL, INTERSECT and MINUS.
❖ SubQuery	subquery, Correlated Subquery, EXIT, ALL and ANY.

Tools (or) Miscellaneous	
❖ IDE's (Integrated Development Environments)	Notepad++, Eclipse , Visual Studio Code, and MySQL workbench.
❖ Build Tools	Apache Maven.
❖ Repositories	GIT.
❖ Web API Platform or Validator	Postman.
❖ Operating System	Linux.
❖ Server	Apache Tomcat Server.
❖ Scrum Methodologies	AGILE

Application or Project Development

Project 1	Creating websites using UI Technologies like HTML, CSS, Javascript and JQuery and Bootstrap.
Project 2	Creating Web applications using J2SE, J2EE, JDBC and MYSQL including UI.
Project 3	Creating Basic Spring applications using J2SE, Spring Framework.
Project 4	Creating Spring MVC applications using Hibernate as DAO and MYSQL
Project 5	Creating Spring Boot Web Application using JPA and MYSQL.
Project 6	Creating Spring Boot Rest API's using JPA and MYSQL.
Project 7	Creating Inter communication Microservices Architecture using Spring Boot Applications.



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