Java Full Stack Development Training Program (120 Hours)

Objective:

- Provide a **comprehensive technical training** on Java Full Stack development.

- Equip students with the necessary skills for **IT company recruitment**.

- Cover **backend, frontend, databases, DevOps, and system design** effectively within 120 hours.

Module 1: Introduction to Full Stack Development (3 Hours)

- Overview of Full Stack Development

- Frontend, Backend, Databases, Cloud & DevOps

- Tools & Technologies (Java, Spring Boot, MySQL, Angular/React, Git, Docker, AWS)

Module 2: Core Java & Object-Oriented Programming (15 Hours)

- Java Basics: Variables, Data Types, Operators

- Control Statements (Loops, Switch, Conditions)

- Arrays & Strings

- Methods & Recursion

- Object-Oriented Programming (OOPs):

  - Classes & Objects

  - Inheritance, Polymorphism

  - Encapsulation, Abstraction

  - Interfaces & Abstract Classes

- Exception Handling

- Collections Framework (ArrayList, HashMap, HashSet, etc.)

- Multithreading & Concurrency

Module 3: Advanced Java & Backend Development (20 Hours)
- Java 8 Features (Lambdas, Streams, Functional Interfaces)

- JDBC (Java Database Connectivity)

- Introduction to Web Development (HTTP, REST API)

- Spring & Spring Boot:

    o Spring Core (Dependency Injection, Beans, Annotations)

    o Spring Boot Setup & Configuration

    o Spring MVC & REST API Development

    o Spring Security & JWT Authentication

    o Connecting Spring Boot with MySQL

- RESTful Web Services (GET, POST, PUT, DELETE)

Module 4: Database Management (10 Hours)
- SQL Basics (DDL, DML, DQL Commands)

- MySQL:

    o Joins, Views, Stored Procedures

    o Indexing & Query Optimization

- Hibernate & JPA (Java Persistence API)

- Connecting Java Applications with MySQL

Module 5: Frontend Development (20 Hours)
HTML, CSS, JavaScript (6 Hours)
- HTML5 Structure & Semantic Elements

- CSS3 (Flexbox & Grid)

- JavaScript Fundamentals

- DOM Manipulation

- ES6+ Features

Frontend Framework (React or Angular) (14 Hours)

- Introduction to React/Angular

- Components & Props (React) / Modules & Components (Angular)

- State Management (React Hooks, Redux) / Services & Dependency Injection (Angular)

- Event Handling & Forms

- API Integration & Axios

- Routing & Navigation

- Building a Single Page Application (SPA)

Module 6: Version Control, Build Tools & Deployment (10 Hours)

- **Git & GitHub:**

    o Git Basics (Clone, Commit, Push, Pull)

    o Branching & Merging

- **Build Tools:**

    o Maven & Gradle Basics

- **Containerization & Deployment:**

    o Docker Basics (Creating & Running Containers)

    o Deploying Applications on AWS / Heroku

    o CI/CD Overview

Module 7: Problem Solving & Competitive Programming (15 Hours)
- DSA with Java:

  - Arrays, Strings, Linked Lists

  - Stacks, Queues, Recursion

  - Sorting & Searching Algorithms

  - HashMaps & HashSets

  - Trees & Graphs

- Time Complexity Analysis

- Solving Coding Problems on Yaksha

Module 8: Mini Project (7 Hours)
- End-to-End Full Stack Application Development

- Backend API + Frontend UI + Database Integration

- CRUD Operations

- Authentication & Authorization (JWT)

Module 9: Advanced Backend & Cloud Technologies (20 Hours)
Microservices Architecture (8 Hours)
- Introduction to Microservices

- Monolithic vs Microservices

- Spring Boot Microservices

- Service Discovery (Eureka)

- API Gateway (Zuul/Spring Cloud Gateway)

- Inter-Service Communication (Feign, RestTemplate)

Cloud & DevOps Fundamentals (6 Hours)

- Introduction to Cloud Computing

- AWS Basics (EC2, S3, RDS)

- CI/CD with GitHub Actions / Jenkins

- Monitoring & Logging with ELK Stack

System Design Basics (6 Hours)

- Scalable System Architecture

- Database Sharding & Indexing

- Load Balancing & Caching

- Real-World Use Cases (E-commerce, Social Media, Banking Apps)

Total Duration: 120 Hours

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