ITKART ACADEMY

Full Stack Development Course Content

Module 1:Introduction to Full Stack Development

- What is Full Stack Development?
- Roles and Responsibilities of a Full Stack Developer
- Overview of Frontend, Backend, Databases, and DevOps
- Tools and Technologies in Full Stack Development

Module 2:Frontend Development

HTML & CSS
- Basics of HTML5: Tags, Attributes, Forms, Media
- Advanced HTML: Semantic HTML, Accessibility
- Basics of CSS3: Selectors, Box Model, Flexbox, Grid
- Advanced CSS: Animations, Media Queries, SCSS/SASS
- Responsive Design Principles

JavaScript
- JavaScript Basics: Variables, Data Types, Loops, Functions
- DOM Manipulation and Events
- ES6+ Features: Arrow Functions, Classes, Promises, Modules
- Error Handling and Debugging
- Asynchronous JavaScript: Fetch API, Async/Await

Frontend Frameworks/Library

- **React.js**:
  - JSX and Component Architecture
  - State Management (useState, useReducer)
  - React Hooks and Lifecycle Methods
  - React Router for Single Page Applications (SPAs)
  - Context API and Redux for Advanced State Management
  - Integration with APIs
- **CSS Frameworks**: Bootstrap, TailwindCSS

Module 3:Backend Development

Node.js and Express.js

- Basics of Node.js: Environment Setup, NPM, Modules
- Event Loop and Asynchronous Programming in Node.js
- Building a REST API using Express.js
- Middleware and Routing
- Authentication and Authorization (JWT, OAuth)
- File Upload and Error Handling

Backend Frameworks

- Introduction to Backend Frameworks like NestJS (Optional)

Module 4: Databases

Relational Databases

- Introduction to SQL
- Database Design and Normalization
- CRUD Operations with MySQL or PostgreSQL
- Writing Complex Queries and Joins

NoSQL Databases

- Introduction to NoSQL and MongoDB
- CRUD Operations in MongoDB
- Aggregation Framework
- Indexing and Performance Optimization

Module 5: Version Control Systems and Collaboration

Git:

- Git Basics: Init, Add, Commit, Push, Pull, Merge
- Branching and Merging
- Resolving Merge Conflicts

GitHub/GitLab:

- Repositories and Collaboration
- Pull Requests and Code Reviews

Module 6: DevOps and Deployment

CI/CD

- Basics of DevOps and CI/CD Pipelines
- Tools: Jenkins, GitHub Actions

Server and Cloud Deployment

- Hosting a Web Application: Netlify, Vercel
- Deploying Full Stack Apps:
    - AWS (EC2, S3, CloudFront)
    - Azure
    - Heroku
- Docker Basics: Containers, Images, Docker Compose

Module 7: Advanced Topics

APIs and Microservices
- RESTful APIs: Principles and Best Practices
- Introduction to GraphQL
- Building and Consuming APIs
- Microservices Architecture Overview

Real-Time Applications
- WebSockets with Socket.io
- Building a Chat Application

Testing
- Frontend Testing with Jest, React Testing Library
- Backend Testing with Mocha, Chai, and Supertest

Module 8: Project Work

Mini Projects
1. Responsive Portfolio Website
2. Blogging Platform
3. To-Do Application with CRUD

Capstone Project
- Build a Full-Stack E-commerce Application:
  - User Authentication and Role Management
  - Product Management (CRUD Operations)
  - Shopping Cart and Payment Gateway Integration
  - Admin Panel for Order Management
  - Deployment on a Cloud Platform