

# Full Stack Development - Complete Course Curriculum

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This curriculum is designed to take learners from beginner to advanced level in Full Stack Development. It includes frontend, backend, databases, deployment, DevOps, APIs, testing, system design, and project building.

## Module 1: Programming Fundamentals

- Introduction to programming concepts
- Variables, data types, operators
- Conditional statements and loops
- Functions and scope
- Arrays and objects
- Problem solving and algorithms
- Introduction to Git and GitHub

## Module 2: HTML5 & CSS3

- HTML document structure
- Semantic HTML
- Forms and validations
- CSS selectors and box model
- Flexbox and Grid
- Responsive web design
- Animations and transitions

## Module 3: JavaScript Essentials

- JavaScript syntax and ES6+
- DOM manipulation
- Events and event handling
- Asynchronous JavaScript
- Promises and async/await
- Fetch API and JSON
- Local storage and session storage

## Module 4: Frontend Framework - React

- React fundamentals
- Components and props
- State and lifecycle
- React hooks
- React Router
- Context API
- State management with Redux
- Building reusable UI components

## Module 5: Backend Development with Node.js

- Introduction to Node.js
- NPM and package management
- Creating servers with Express.js
- Middleware and routing
- REST API development
- Authentication and authorization
- JWT and sessions

## Module 6: Databases

- SQL fundamentals
- MySQL/PostgreSQL
- Database design
- CRUD operations
- Joins and relationships
- MongoDB basics
- Mongoose ORM

## Module 7: API Development

- RESTful API architecture
- API security
- Error handling
- Rate limiting
- Swagger/OpenAPI documentation
- GraphQL introduction

## Module 8: DevOps & Deployment

- Linux basics
- Environment variables
- Docker fundamentals
- CI/CD pipelines
- Cloud deployment
- AWS basics
- Netlify, Vercel, and Render deployment

## Module 9: Testing

- Unit testing
- Integration testing
- Jest fundamentals
- API testing
- Frontend testing with React Testing Library

## Module 10: System Design & Security

- System architecture basics
- Scalability concepts
- Caching
- Authentication strategies
- OWASP security basics
- Performance optimization

## Module 11: Projects

- Portfolio website
- Blog application
- E-commerce platform
- Chat application
- Task management system
- Full stack capstone project

## Module 12: Career Preparation

- Resume building
- GitHub portfolio
- Interview preparation
- DSA basics for interviews

- Freelancing and internships

## Suggested Learning Timeline

Phase	Duration
Programming Fundamentals	2 Weeks
Frontend Development	6 Weeks
Backend Development	5 Weeks
Databases & APIs	3 Weeks
Deployment & DevOps	2 Weeks
Projects & Interview Prep	4 Weeks

By completing this curriculum, learners will be able to build and deploy modern full stack web applications, work with frontend and backend technologies, and prepare for software development careers.