

15 Days (Introduction to MERN Stack)

Objective:

- Familiarize participants with the MERN stack and basic web development concepts.

Syllabus:

1. **Day 1-2:** Introduction
 - a. Overview of MERN stack and career opportunities.
 - b. Setting up development environments (VS Code, Node.js, MongoDB).
2. **Day 3-5:** HTML, CSS, JavaScript Basics
 - a. HTML5 structure and elements.
 - b. CSS3 styling basics, responsive design.
 - c. JavaScript fundamentals (variables, loops, DOM).
3. **Day 6-8:** Git and GitHub
 - a. Version control basics.
 - b. Creating repositories, pushing changes, and collaboration.
4. **Day 9-12:** Introduction to Node.js
 - a. Basics of Node.js.
 - b. Package management with npm.
5. **Day 13-15:** Introduction to MongoDB
 - a. NoSQL vs. SQL databases.
 - b. Basics of MongoDB, CRUD operations.

30 Days (Beginner-Level MERN Development)

Objective:

- Build foundational knowledge of the MERN stack.

Syllabus:

1. **Week 1-2:** Frontend Development
 - a. Deep dive into HTML, CSS, and JavaScript.
 - b. Bootstrap and responsive design.
2. **Week 3:** React Basics
 - a. Introduction to React.js and JSX.
 - b. Functional components, state, and props.
3. **Week 4:** Backend Basics

- a. RESTful APIs with Express.js and Node.js.
- b. Basic routing and middleware.

45 Days (Intermediate-Level MERN Development)

Objective:

- Develop interactive full-stack applications.

Syllabus:

1. **Week 1-2:** Advanced React.js
 - a. React Hooks and Context API.
 - b. Component lifecycle methods.
2. **Week 3:** Advanced Node.js and Express.js
 - a. Middleware, authentication, and authorization (JWT).
 - b. API development and error handling.
3. **Week 4:** MongoDB
 - a. Aggregations, indexing, and relationships.
 - b. Connecting MongoDB to Node.js.
4. **Week 5:** Full-Stack Basics
 - a. Create a simple MERN application (Frontend + Backend).
 - b. Deployment basics (Netlify, Heroku).

60 Days (Advanced MERN Development)

Objective:

- Build complex, real-world applications.

Syllabus:

1. **Week 1-2:** Advanced Frontend
 - a. State management with Redux.
 - b. Advanced CSS frameworks (Material-UI, Tailwind CSS).
2. **Week 3-4:** Backend Development
 - a. Role-based authentication and session handling.
 - b. Advanced API concepts: pagination, filtering.
3. **Week 5:** Full-Stack Integration
 - a. Building dynamic and secure APIs.
 - b. Integrating frontend with backend.

4. **Week 6:** Real-World Project
 - a. Develop a small MERN project (e.g., Task Manager).

90 Days (Comprehensive MERN Development)

Objective:

- Master MERN stack with advanced features and deployment.

Syllabus:

1. **Week 1-4:** Advanced Frontend & Backend
 - a. Advanced React patterns (React Query, Code Splitting).
 - b. Building scalable APIs with Node.js.
2. **Week 5-6:** Database Management
 - a. MongoDB schema design.
 - b. Cloud database management with MongoDB Atlas.
3. **Week 7:** Testing and Debugging
 - a. Writing unit tests (Jest, React Testing Library).
 - b. Debugging and performance optimization.
4. **Week 8-9:** Deployment and CI/CD
 - a. Setting up CI/CD pipelines.
 - b. Deploying full-stack applications (AWS, Vercel).

180 Days (Expert-Level MERN Development)

Objective:

- Achieve expertise and build enterprise-level projects.

Syllabus:

1. **Month 1-3:** Advanced Concepts
 - a. Microservices architecture.
 - b. GraphQL with MERN stack.
 - c. Advanced state management (Zustand, MobX).
2. **Month 4-5:** Large-Scale Application Development
 - a. Building enterprise-grade applications (e.g., E-commerce).
 - b. Advanced authentication (OAuth, SSO).
3. **Month 6:** Final Project and Industry Readiness
 - a. Capstone project with industry standards.

- b. Resume building, interview preparation.
- c. Internship tasks and mentoring junior developers.