

Full Stack Developer Induction Program (MERN + AI Integration)

Duration: 22days (176 hours)

Prerequisite: Overview of Web Application and any programming language

Week 1: Web Foundations + Design to Code

Day 1: Web Fundamentals & HTML Deep Dive

Topics

- Full Stack Architecture (Frontend vs Backend vs DB)
- MERN Stack overview (Request lifecycle)
- Dev setup: Node, npm, Git workflow (clone, commit, push)
- HTML5 Deep Dive:
 - Semantic tags (section, article, nav, aside)
 - Forms: input types, validation attributes
 - Accessibility (ARIA labels, alt text)
 - SEO basics (meta tags, headings hierarchy)
- Browser DevTools basics

Labs

- Create **professional resume webpage (semantic + SEO optimized)**
 - Build **registration form with validation (pattern, required, email)**
 - Inspect HTML using DevTools + fix accessibility issues
 - Git lab: Push HTML project to GitHub
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Day 2: CSS Advanced + Responsive UI

Topics

- CSS specificity & inheritance deep dive
- Box model + layout debugging
- Flexbox (alignment, ordering, wrapping)
- Grid (template areas, auto-fit, minmax)
- Responsive design:
 - Media queries
 - Mobile-first approach
- CSS variables, transitions, animations

Labs

- Build **responsive e-commerce product grid**
- Create **navbar with mobile hamburger menu**
- Design **animated landing section**

- Convert static page → fully responsive layout
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Day 3: JavaScript Core + DOM

Topics

- Execution context & scope
- Data types (primitive vs reference)
- Functions (closures, hoisting)
- DOM:
 - querySelector vs getElementById
 - create/remove elements
- Events:
 - bubbling vs capturing
 - delegation

Labs

- Build **ToDo app with add/delete/edit**
 - Create **dynamic form validation system**
 - Implement **event delegation (list click handler)**
 - Store/retrieve data using LocalStorage
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Day 4: Modern JavaScript + Async Programming

Topics

- ES6+: destructuring, spread/rest
- Modules (ESM vs CommonJS)
- Promises vs async/await
- Fetch API (GET, POST)
- Error handling (try/catch)
- Array methods (map, filter, reduce)

Labs

- Build **API-based weather app**
 - Create **search/filter system using reduce**
 - Convert callback-based code → async/await
 - Handle API error scenarios
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Day 5: Figma to Code + AI Tools

Topics

- Design-to-development workflow
- Figma Dev Mode:
 - Extract CSS, spacing, typography

- Design systems (colors, spacing tokens)
- AI tools (ChatGPT/Claude for UI generation)
- Figma plugins (Anima, Locofy)

Labs

- Convert **Figma design** → **pixel-perfect HTML/CSS page**
 - Extract and reuse design tokens
 - Generate UI code using AI prompts
 - Improve generated UI manually
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Week 2: React Development (Industry Level)

Day 6: React Fundamentals

Topics

- React architecture
- JSX deep dive
- Functional components
- Props & state lifecycle

Labs

- Build **multi-component dashboard UI**
 - Create reusable **Card component**
 - Build **interactive counter app**
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Day 7: Routing + Lifecycle

Topics

- React Router v6:
 - Nested routes
 - Dynamic params
- useEffect lifecycle
- Conditional rendering patterns

Labs

- Create **multi-page blog application**
 - Fetch API data on page load
 - Highlight active navigation routes
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Day 8: Forms + Custom Hooks

Topics

- Controlled vs uncontrolled inputs

- Formik + Yup validation
- Custom hooks design

Labs

- Build **multi-step registration form**
 - Create reusable **useForm hook**
 - Add validation with error UI
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Day 9: State Management (Redux + Context)

Topics

- Redux Toolkit:
 - createSlice, store
 - asyncThunk
- Context API vs Redux
- Global state design patterns

Labs

- Build **authentication state using Redux**
 - Create **theme switcher using Context**
 - Integrate API with Redux store
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Day 10: React Advanced (React Query + RxJS)

Topics

- React Query:
 - caching, refetching
- RxJS:
 - Observables
 - debounceTime
- Performance optimization

Labs

- Build **API data table with loading/error states**
 - Implement **search autocomplete (debounce)**
 - Optimize re-render performance
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Week 3: Backend + Databases

Day 11: Node.js + Express

Topics

- Node.js event loop

- Express routing
- Middleware chain
- REST API best practices

Labs

- Build **User CRUD REST API**
 - Implement **custom logger middleware**
 - Test APIs using Postman
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Day 12: MongoDB + Mongoose

Topics

- Collections vs documents
- Schema design
- Validation & hooks
- Relationships

Labs

- Create **Product + Category models**
 - Build **CRUD APIs with validation**
 - Link user → orders → products
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Day 13: MySQL + Sequelize

Topics

- SQL fundamentals
- Joins (INNER, LEFT)
- Sequelize ORM
- Associations

Labs

- Build **relational schema (User, Order, Product)**
 - Implement **join queries**
 - Create API with Sequelize
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Day 14: Authentication + Security

Topics

- JWT flow
- bcrypt hashing
- Role-based authorization
- Security:
 - Helmet

- CORS
- Rate limiting

Labs

- Build **secure login/register system**
 - Protect routes using middleware
 - Implement role-based access
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Day 15: Full Stack Integration

Topics

- Connecting React + Express
- Axios interceptors
- Environment variables
- Deployment basics

Labs

- Integrate frontend with backend APIs
 - Setup environment configs
 - Deploy app (frontend + backend)
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Week 4: AI + No-Code + Capstone

Day 16: No-Code Development (Vibe Coding)

Topics

- No-code platforms overview
- Visual UI building
- Data binding concepts

Labs

- Build **ToDo app using no-code platform**
 - Create UI with drag-drop components
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Day 17: APIs + Interactivity (No-Code)

Topics

- Event-driven logic
- API integration
- Dynamic UI rendering

Labs

- Build **API-based dashboard**

- Create form with validation
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Day 18: AI-Assisted Development

Topics

- Prompt engineering for developers
- Code generation using AI
- Debugging with AI

Labs

- Generate UI from prompt
 - Optimize existing project using AI
 - Debug code using AI assistant
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Day 19–21: Capstone Project (Enterprise Level)

Project Options

- Inventory System
- CRM System
- E-commerce Platform

Implementation

- React frontend
- Node backend
- MongoDB + MySQL
- JWT Authentication
- Redux + React Query
- Optional AI integration

Labs

- Day 19: Design + DB schema + API structure
 - Day 20: Frontend + Backend integration
 - Day 21: Deployment + testing + optimization
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Day 22: Presentation + Evaluation

Activities

- Project demo
- Code review (best practices)
- Feedback + improvement plan