IICIS

6-Month Course

Full Stack Development

www.iicis.org

24 Weeks (6 Months)

Proficiency in frontend, backend, databases, and deployment with real-world applications

Instructor-led + Hands-on Coding + Projects + Labs

Module	Module Title
1	Web Development Foundations
2	Frontend Development
3	Backend Development
4	Databases & Storage
	Revision & Internal Assessment
5	Full Stack Integration
6	Deployment & DevOps Basics
7	Advanced Topics
8	Capstone Project & Career Preparation
	Final Evaluation

Module 1: Web Development Foundations (Week 1–2)

Content:

- Introduction to Web Development: Frontend vs Backend vs Full Stack
- HTML5: Semantic Tags, Forms, Multimedia
- CSS3: Flexbox, Grid, Animations, Media Queries
- JavaScript ES6+: Variables, Functions, Loops, Template Literals
- Git & GitHub for Version Control, Branching & Pull Requests

Labs/Project:

1. Build a Personal Portfolio Website with responsive design
2. Push project to GitHub with proper commits

Module 2: Frontend Development (Week 3–6)

Content:

- Advanced JavaScript: DOM Manipulation, Events, Fetch API, Async/Await, ES Modules
- Modern Frontend Framework: React.js Fundamentals

  Components, Props, State, Lifecycle Methods, Hooks

  React Router & Navigation

  Context API & State Management Basics
- UI Libraries: Tailwind CSS / Bootstrap
- Basic Unit Testing with Jest / React Testing Library

Lab / Project:

1. Build a Blogging Platform Frontend using React
2. Implement dynamic components, routing, and responsive UI

Module 3: Backend Development (Week 7–10)

Content:

- Node.js Fundamentals: Event Loop, Modules, npm Packages
- Express.js Framework: Routing, Middleware, REST API Development
- Authentication & Authorization: JWT, OAuth 2.0 Basics
- File Uploads & API Security Basics
- Error Handling, Logging & Debugging Techniques

Labs/Project:

1. Develop RESTful APIs for a Task Manager Application
2. Test APIs using Postman or Insomnia

Module 4: Databases & Storage (Week 11–14)

Relational Databases: MySQL / PostgreSQL

- Schema Design, Joins, Indexing, Complex Queries

NoSQL Databases: MongoDB

- Collections, CRUD Operations, Aggregation Pipelines

ORMs: Sequelize / Mongoose

Database Security, Backup & Optimization

Lab / Project:

1. Design and integrate a database for an E-commerce Application
2. Connect database to backend APIs and perform CRUD operations

Module 5: Full Stack Integration (Week 15–18)

- **Connect Frontend (React) with Backend (Node.js + Express)**
- **REST API Integration using Axios / Fetch**
- **Authentication Flows: Login / Signup System**
- **State Management with Redux (optional)**
- **Role-Based Access Control (RBAC) Basics**

Lab / Project:

1. Full Stack Social Media Mini-Application
2. Implement authentication, API calls, and role-based access

Module 6: Deployment & DevOps Basics (Week 19–20)

Content:

- Hosting Frontend: Netlify, Vercel
- Deploying Backend & Database: Heroku, AWS, Render
- Docker Basics: Containers, Images, Dockerfile
- CI/CD Pipeline Introduction with GitHub Actions

Lab / Project:

1. Deploy a Full Stack Application on cloud
2. Test live URLs and API endpoints

Module 7: Advanced Topics (Week 21–22)

Content:

- GraphQL Basics: Queries, Mutations, Schema Design
- WebSockets & Real-Time Communication
- REST vs GraphQL: When to use which
- Introduction to Microservices & API Gateway

Lab / Project:

1. Real-time Chat Application with WebSockets
2. Implement live messaging & basic notifications

Module 8: Capstone Project & Career Preparation (Week 23–24)

End-to-End Project (Choose 1):

- E-Commerce Website with Cart & Payment Integration
- Learning Management System (LMS)
- Job Portal with Authentication & Search
- Online Booking System (Hotel / Events)

- **Resume Building & GitHub Portfolio Setup**
- **Interview Preparation: Coding Challenges, System Design Basics, API Design**

Labs:

1. Deploy final capstone project on cloud
2. Showcase project with full documentation and live demo