

Full Stack +Blockchain Development Training (5 Months)

Overview:

This 5-month intensive program is designed to transform students into **industry-ready Full Stack + Web3 Developers**. It combines modern web development (MERN stack) with blockchain development, enabling learners to build **scalable Web2 + Web3 hybrid applications**.

Students begin with frontend fundamentals, progress to backend development, and then dive into blockchain concepts, smart contracts, and decentralized application (DApp) development. The course emphasizes **hands-on learning, real-world projects, and deployment practices**, ensuring students gain practical industry experience.

Course Objectives:

- Understand complete **client-server architecture** and Web3 integration
 - Build responsive frontends using **React.js and modern UI frameworks**
 - Develop backend systems using **Node.js, Express, and MongoDB**
 - Learn blockchain fundamentals and develop smart contracts using **Ethereum**
 - Integrate frontend with blockchain using **Ethers.js**
 - Deploy applications and smart contracts on testnets
 - Build real-world projects including **DApps, NFT platforms, and full-stack applications**
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Program Structure:

The program spans **20 weeks (100 days)** with **5 sessions per week**. Each week focuses on a specific module, ending with a **project or practical deliverable**.

Phase 1: Frontend Development (React)

Week 1: Web Fundamentals

- **Day 1:** Course orientation, setup (VS Code, Git)
- **Day 2–3:** HTML fundamentals, semantic tags
- **Day 4:** CSS (Flexbox, responsiveness)
- **Day 5:** JavaScript basics (variables, functions)

Deliverable: Responsive portfolio webpage

Week 2: JavaScript + DOM

- **Day 6:** ES6 concepts
- **Day 7:** Arrays, objects
- **Day 8:** DOM manipulation
- **Day 9:** Events & interactivity
- **Day 10:** API basics

Deliverable: Interactive web app (quiz/form)

Week 3: React Basics

- **Day 11:** React setup (Vite)
- **Day 12:** Components & props
- **Day 13:** useState
- **Day 14:** useEffect + API calls
- **Day 15:** Project

Deliverable: API-based React app

Week 4: Advanced React

- **Day 16:** Routing
- **Day 17:** Forms & validation
- **Day 18:** Context API

- **Day 19:** Custom hooks
- **Day 20:** Dashboard UI

Deliverable: React dashboard

Phase 2: Backend + MERN Stack

Week 5: Node.js & Express

- **Day 21:** Node basics
- **Day 22:** Express setup
- **Day 23:** REST APIs
- **Day 24:** Middleware
- **Day 25:** API project

Deliverable: CRUD API

Week 6: MongoDB

- **Day 26:** Database basics
- **Day 27:** Mongoose
- **Day 28:** CRUD operations
- **Day 29:** Schema design
- **Day 30:** Integration

Deliverable: Backend with database

Week 7: Authentication

- **Day 31:** JWT
- **Day 32:** Login/Register
- **Day 33:** Role-based access
- **Day 34:** Security basics

- **Day 35:** Project

Deliverable: Auth system

Week 8: Full Stack Integration

- **Day 36:** React + backend integration
- **Day 37:** State management
- **Day 38:** Error handling
- **Day 39:** Pagination & search
- **Day 40:** Full project

Deliverable: Complete MERN app

Phase 3: Blockchain Fundamentals

Week 9: Blockchain Basics

- **Day 41:** Blockchain intro
- **Day 42:** Wallets & MetaMask
- **Day 43:** Transactions & gas
- **Day 44:** Ethereum ecosystem
- **Day 45:** Smart contract intro

Deliverable: First smart contract

Week 10: Solidity Programming

- **Day 46:** Syntax & structure
- **Day 47:** Functions & mappings
- **Day 48:** Events & modifiers
- **Day 49:** Structs & arrays
- **Day 50:** Project

Deliverable: Storage contract

Week 11: Smart Contracts

- **Day 51:** ERC20 tokens
- **Day 52:** NFTs (ERC721)
- **Day 53:** OpenZeppelin
- **Day 54:** Security basics
- **Day 55:** Project

Deliverable: Token + NFT

Week 12: Tools & Deployment

- **Day 56:** Hardhat setup
- **Day 57:** Testing
- **Day 58:** Deployment
- **Day 59:** Scripts
- **Day 60:** Testnet deployment

Deliverable: Deployed contract

Phase 4: DApp Development

Week 13: Web3 Integration

- **Day 61:** Ethers.js
- **Day 62:** Wallet connection
- **Day 63:** Read/write contracts
- **Day 64:** Transactions
- **Day 65:** Project

Deliverable: Basic DApp

Week 14: Advanced DApps

- **Day 66:** State sync
- **Day 67:** Events handling
- **Day 68:** UI + blockchain sync
- **Day 69:** Error handling
- **Day 70:** Project

Deliverable: Advanced DApp

Week 15: DeFi & NFTs

- **Day 71:** DeFi basics
- **Day 72:** NFT marketplace
- **Day 73:** Token interaction
- **Day 74:** Gas optimization
- **Day 75:** Project

Deliverable: NFT marketplace

Week 16: Multi-chain + ICP

- **Day 76:** Polygon/BSC
- **Day 77:** Internet Computer intro
- **Day 78:** Canisters & cycles
- **Day 79:** ICP DApp
- **Day 80:** Project

Deliverable: ICP-based app

Phase 5: Advanced + Capstone

Week 17: Advanced Blockchain

- **Day 81:** Security deep dive
- **Day 82:** Auditing basics
- **Day 83:** Gas optimization
- **Day 84:** Upgradeable contracts
- **Day 85:** Task

Deliverable: Audit report

Week 18: Deployment & DevOps

- **Day 86:** Deployment (Vercel/Render)
- **Day 87:** CI/CD
- **Day 88:** Environment configs
- **Day 89:** Monitoring
- **Day 90:** Project deployment

Deliverable: Live application

Week 19: Interview Preparation

- **Day 91:** DSA basics
 - **Day 92:** System design
 - **Day 93:** Blockchain Q&A
 - **Day 94:** Resume building
 - **Day 95:** Mock interviews
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Week 20: Capstone Project

- **Day 96–100:**
Students build a **complete industry-level project**

Options:

- Web3 E-commerce
- NFT Marketplace
- DeFi Platform
- DAO System

Deliverable: Final project + presentation

Learning Outcomes & Career Readiness

- Develop complete **full-stack applications (MERN)**
- Build and deploy **smart contracts and DApps**
- Integrate Web2 and Web3 systems
- Gain experience with **Git, deployment, and testing workflows**
- Create a strong portfolio with **6–8 projects + 1 capstone**

Students will be job-ready for roles like:

- Full Stack Developer
- Web3 Developer
- Blockchain Developer

Weekly Assignments

Week 1 Assignment:

- Build a **responsive portfolio webpage**
- Include sections: About, Projects, Contact

- Apply Flexbox/Grid

Evaluation Focus:

- HTML structure (semantic correctness)
 - CSS responsiveness
 - UI consistency
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Week 2 Assignment:

- Create an **interactive JavaScript app**
 - Example: Quiz App / Form Validator

Evaluation Focus:

- JavaScript logic
 - DOM manipulation
 - Event handling
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Week 3 Assignment:

- Build a **React API project**
 - Fetch & display data from API

Evaluation Focus:

- Component structure
 - State management
 - API integration
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Week 4 Assignment:

- Develop a **React Dashboard UI**
- Include routing + forms

Evaluation Focus:

- Routing implementation
 - Code structure
 - Reusability of components
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Week 5 Assignment:

- Create a **REST API (CRUD)**

Evaluation Focus:

- API design
 - Proper routing
 - HTTP methods usage
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Week 6 Assignment:

- Integrate **MongoDB with backend**

Evaluation Focus:

- Database schema design
 - CRUD operations
 - Data validation
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Week 7 Assignment:

- Implement **Authentication System**

Evaluation Focus:

- JWT implementation
 - Security practices
 - Role-based access
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Week 8 Assignment:

- Build a **Full Stack MERN App**

Evaluation Focus:

- Frontend-backend integration
 - Error handling
 - UI + API consistency
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Week 9 Assignment:

- Deploy first **smart contract**

Evaluation Focus:

- Understanding of blockchain concepts
 - Contract logic
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Week 10 Assignment:

- Build **Solidity storage contract**

Evaluation Focus:

- Solidity syntax
 - Data handling
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Week 11 Assignment:

- Create **ERC20 Token / NFT Contract**

Evaluation Focus:

- Standard implementation
 - Use of libraries
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Week 12 Assignment:

- Deploy contract using **Hardhat**

Evaluation Focus:

- Deployment scripts
 - Testing practices
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Week 13 Assignment:

- Build **Basic DApp (wallet + contract interaction)**

Evaluation Focus:

- Wallet connection
 - Read/write contract
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Week 14 Assignment:

- Develop **Advanced DApp UI**

Evaluation Focus:

- UI synchronization with blockchain
 - Error handling
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Week 15 Assignment:

- Create **NFT Marketplace (basic)**

Evaluation Focus:

- Smart contract integration
 - Transaction handling
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Week 16 Assignment:

- Build **ICP-based DApp** using Internet Computer

Evaluation Focus:

- Understanding of ICP architecture
 - Canister interaction
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Week 17 Assignment:

- Perform **Smart Contract Audit (basic)**

Evaluation Focus:

- Security understanding
 - Vulnerability detection
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Week 18 Assignment:

- Deploy **Full Application (Web2 + Web3)**

Evaluation Focus:

- Deployment process
 - Environment handling
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Week 19 Assignment:

- Complete **Mock Interview + Resume Submission**

Evaluation Focus:

- Communication skills
 - Technical clarity
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Week 20 Assignment (Final Capstone):

Build an **Industry-Level Project**

Must include:

- Full Stack (MERN)

- Smart Contract integration
- Wallet interaction
- Deployment