Software Development

Program Brochure · 2026

MERN STACK FULL STACK

MongoDB, Express, React, Node.

Intermediate

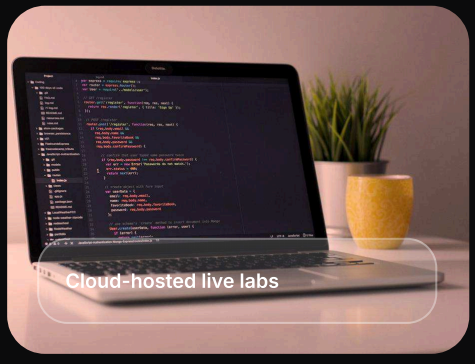
120 Hours

SAM-MERN

Software Development

Code that ships.

18 programs in this track



8

modules · hands-on labs · capstone project

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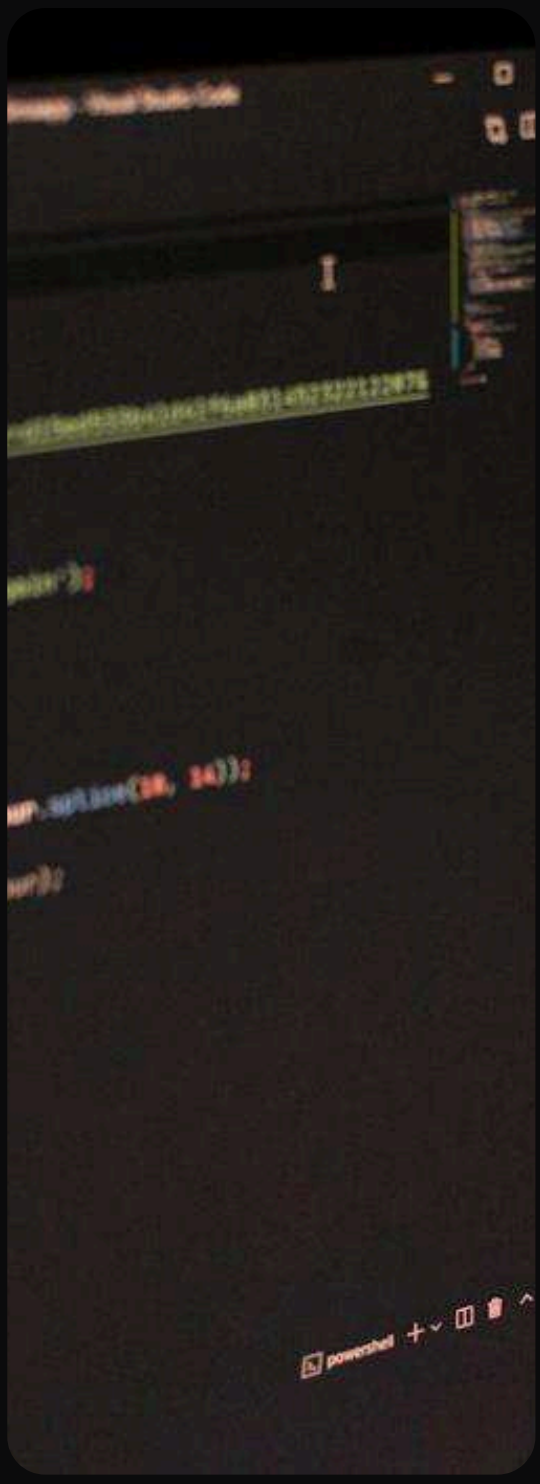
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AT A GLANCE

Level	**Intermediate**
Duration	**120 Hours**
Modules	**8**
Certificate	**SAM-MERN**

Program overview

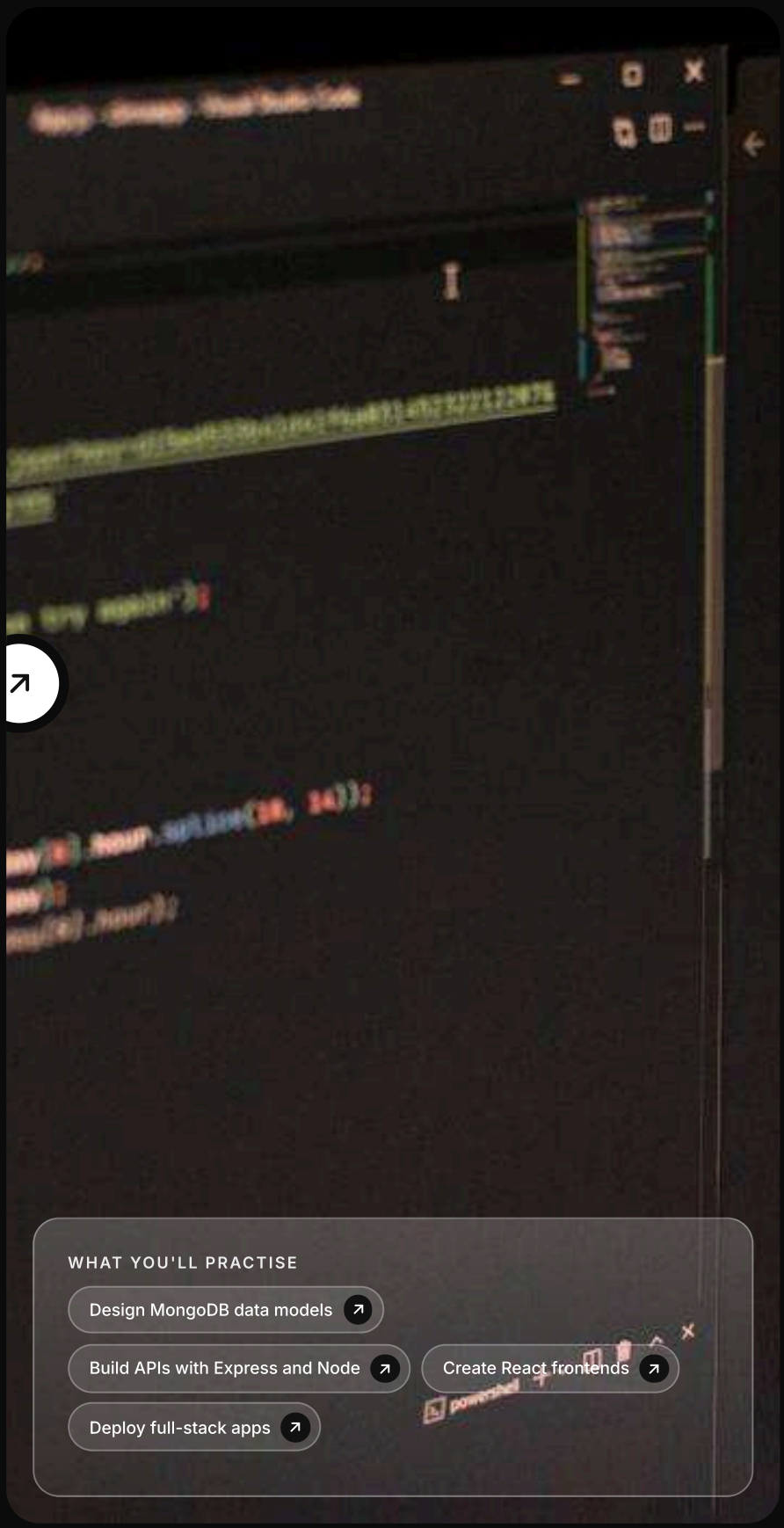
MongoDB, Express, React, Node.

Build complete web applications with the MERN stack, from database to UI.

The MERN stack lets one developer build an entire web product in JavaScript, from database to user interface. This program takes you through MongoDB, Express, React and Node.js as one integrated workflow, covering data modelling, REST APIs, authentication, modern React frontends, testing and deployment, so you can deliver complete full-stack applications.

DELIVERY

Instructor-led · Live virtual · Blended



WHAT YOU'LL PRACTISE

- Design MongoDB data models
- Build APIs with Express and Node
- Create React frontends
- Deploy full-stack apps

LEVEL

Intermediate

DURATION

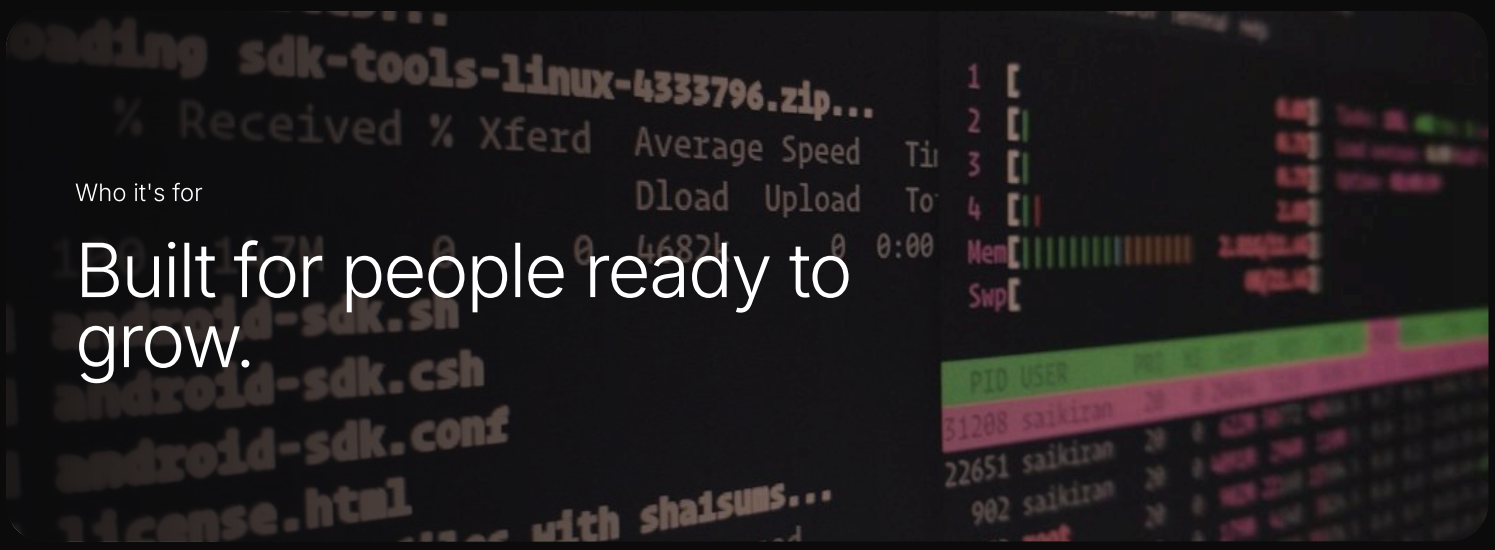
120 Hours

CERTIFICATION

SAM-MERN

TRACK

Software Development



Who it's for

Built for people ready to grow.

01

Students & freshers

Python, Java, C/C++ and JavaScript foundations

02

Frontend developers

React, Angular and TypeScript

03

Backend developers

Node, Django, FastAPI and Spring Boot

04

Senior engineers

Microservices, system design, leadership

PREREQUISITES

- Solid JavaScript ES6+ fundamentals — 01
- HTML and CSS layout skills — 02
- Basic Git and command-line usage — 03

ROLES THIS PREPARES YOU FOR

- MERN Stack Developer ↗
- Full Stack JavaScript Developer ↗
- Frontend Developer (React) ↗
- Backend Developer (Node.js) ↗
- Web Application Developer ↗

Learning outcomes

What you'll be able to do.



01 Design MongoDB schemas with Mongoose, indexes and aggregation

02 Build secure REST APIs using Express and Node.js

03 Develop React frontends with hooks, routing and state

04 Implement end-to-end authentication with JWT and protected routes

05 Integrate payments, uploads and real-time features into apps

06 Test, containerise and deploy MERN applications with CI/CD

Program runway

Module by module.

8
modules · 120 hours

01	**Full-Stack Foundations** How full-stack web apps work, Modern JavaScript refresher, Git and GitHub workflow	12 hrs
02	**MongoDB and Data Modelling** MongoDB documents and collections, CRUD with MongoDB Atlas, Mongoose schemas and validation	14 hrs
03	**Express and Node APIs** Express routing and controllers, Middleware and error handling, Validation with Zod	18 hrs
04	**Authentication and Security** Password hashing and JWT, Refresh tokens and HTTP-only cookies, Role-based access control	14 hrs
05	**React Frontend Development** Components, props and hooks, React Router and layouts, Forms with React Hook Form	22 hrs
06	**Integrating the Full Stack** Connecting React to Express APIs, Protected routes and auth state, Cart and checkout flow	16 hrs
07	**Testing and Quality** API tests with Jest and Supertest, React Testing Library, End-to-end tests with Playwright	10 hrs
08	**Deployment and Capstone Delivery** Environment variables and configuration, Docker and Docker Compose, CI/CD with GitHub Actions	14 hrs
★	**Capstone · Full-Stack E-Commerce Store** Assessment, capstone review and certification	

The syllabus.

Modules 01–03

Module 01

Full-Stack Foundations

12 hours

Hands-on lab
Set up a monorepo with Node backend and Vite React frontend.

TOPICS COVERED

- How full-stack web apps work
- Modern JavaScript refresher
- Git and GitHub workflow
- Node.js and npm essentials
- HTTP, REST and JSON

Git · GitHub · React · Node.js

Module 02

MongoDB and Data Modelling

14 hours

Hands-on lab
Design and seed a MongoDB schema for an online store.

TOPICS COVERED

- MongoDB documents and collections
- CRUD with MongoDB Atlas
- Mongoose schemas and validation
- Embedding versus referencing
- Indexes and aggregation pipeline

MongoDB

Module 03

Express and Node APIs

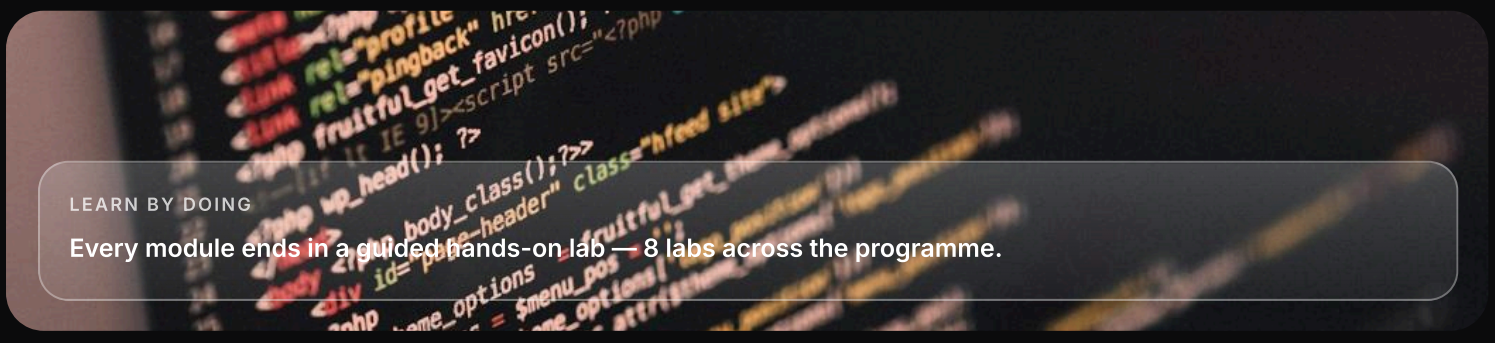
18 hours

Hands-on lab
Build the store's product and category REST API.

TOPICS COVERED

- Express routing and controllers
- Middleware and error handling
- Validation with Zod
- Pagination, filtering and search
- File uploads with Multer and Cloudinary
- API documentation with OpenAPI

Express



LEARN BY DOING

Every module ends in a guided hands-on lab — 8 labs across the programme.

Syllabus, continued.

Modules 04–06

Module 04

Authentication and Security

14 hours

Hands-on lab
Add secure signup, login and admin-only routes to the API.

TOPICS COVERED

- Password hashing and JWT
- Refresh tokens and HTTP-only cookies
- Role-based access control
- CORS, Helmet and rate limiting
- OWASP Top 10 basics

OWASP

Module 05

React Frontend Development

22 hours

Hands-on lab
Build the storefront UI consuming the product API.

TOPICS COVERED

- Components, props and hooks
- React Router and layouts
- Forms with React Hook Form
- Tailwind CSS styling
- Context and Zustand state
- TanStack Query data fetching

React

Module 06

Integrating the Full Stack

16 hours

Hands-on lab
Implement end-to-end cart, checkout and test-mode payments using Razorpay or Stripe.

TOPICS COVERED

- Connecting React to Express APIs
- Protected routes and auth state
- Cart and checkout flow
- Payment gateway integration (Razorpay or Stripe)
- Real-time updates with Socket.IO

React Express



LEARN BY DOING

Every module ends in a guided hands-on lab — 8 labs across the programme.

Syllabus, continued.

Modules 07–08

Module 07

Testing and Quality

10 hours

Hands-on lab
Write API, component and end-to-end tests for checkout.

TOPICS COVERED

- API tests with Jest and Supertest
- React Testing Library
- End-to-end tests with Playwright
- Linting with ESLint and Prettier
- TypeScript adoption overview

React TypeScript

Module 08

Deployment and Capstone Delivery

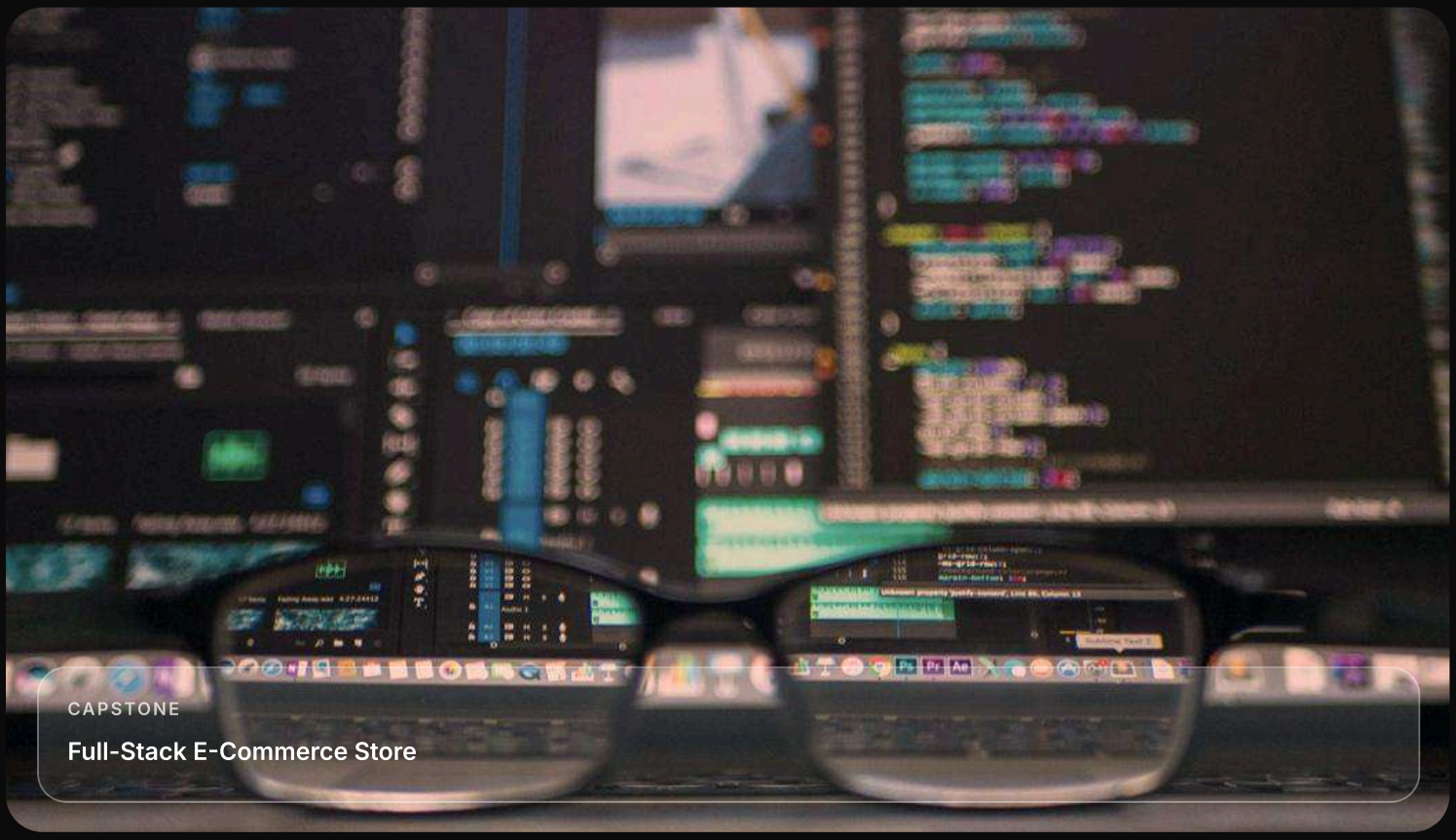
14 hours

Hands-on lab
Deploy the full MERN app with Docker and a CI pipeline.

TOPICS COVERED

- Environment variables and configuration
- Docker and Docker Compose
- CI/CD with GitHub Actions
- Deploying to Render, Vercel or a VPS
- Monitoring and logging basics
- Capstone presentation and assessment

GitHub Docker



CAPSTONE

Full-Stack E-Commerce Store



MongoDB
Document database

Express
Node web framework

React
Frontend UI library

Node.js
JavaScript runtime

OWASP
Top 10 & testing standards

Git
Version control

GitHub
Code hosting & Actions CI

Docker
Containers & images

JavaScript
Web language

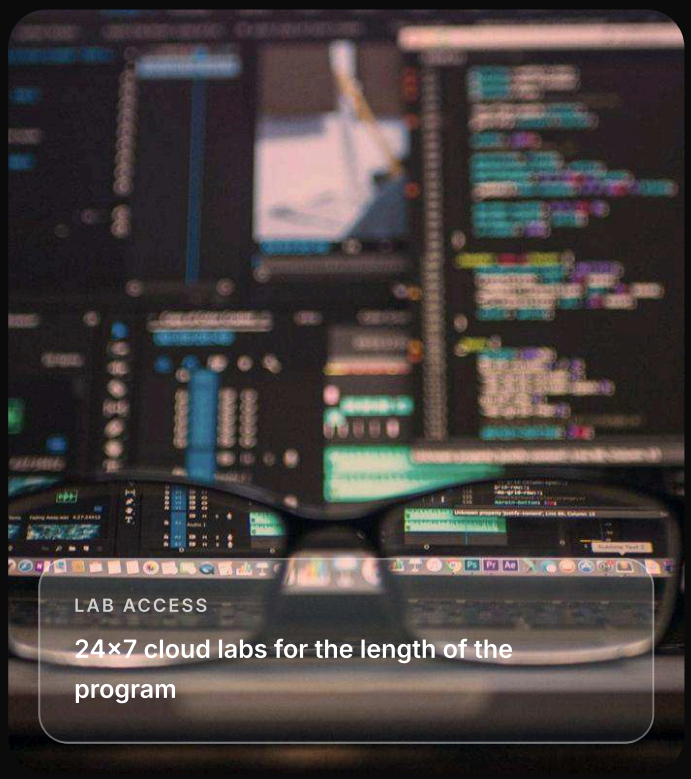
TypeScript
Typed JavaScript

Frameworks & standards

OWASP

FOCUS AREAS

Design MongoDB data models	01
Build APIs with Express and Node	02
Create React frontends	03
Deploy full-stack apps	04



01

Personal Blogging Platform

A MERN blog with authentication, rich-text posts, image uploads, comments and an admin dashboard for content moderation.

02

Real-Time Chat App

A chat application using Socket.IO, MongoDB message history, user presence indicators and a responsive React interface.

03

Expense Tracker Dashboard

A full-stack expense tracker with categories, monthly charts, filters and secure per-user data stored in MongoDB.



Capstone project

Full-Stack E-Commerce Store

Build and deploy a complete MERN e-commerce store with product catalogue, search, cart, test-mode payments, order tracking, admin panel, JWT authentication, automated tests and CI/CD-driven deployment.

Real-world scenario

Mentor review

Portfolio ready

Certification

SAM-MERN

Awarded on successful completion of the program assessments.

- MCQ assessments
- Practical lab evaluation
- Project & capstone review
- Final presentation



The SAM Learning Framework™

Scenario · Apply · Master · Mentor

Phase 01

Scenario

Real-world attack and use-case scenarios open every module.

Phase 02

Apply

Hands-on lab work, CTF challenges and live projects.

Phase 03

Master

Assessment, peer review and certification prep.

Phase 04

Mentor

Post-program career guidance and support.

DELIVERY MODELS

- Instructor-Led (ILT)
- Virtual Instructor-Led
- Self-Paced Online
- E-Learning Licensing
- Blended Learning
- Corporate Onsite
- Bootcamp Intensive

Learning path · Software Development

Where this program fits.

Beginner	Intermediate	Advanced	Expert
4 programs	You are here	3 programs	1 programs

Before this

Python Programming Fundamentals	40 Hours
Java Programming Fundamentals	48 Hours
C & C++ Programming	48 Hours
JavaScript Essentials	40 Hours

Up next

Full Stack Development (React + Node + MongoDB)	160 Hours
Microservices Architecture	72 Hours
System Design & Architecture	64 Hours



CAREER ROLES

- MERN Stack Developer
- Full Stack JavaScript Developer
- Frontend Developer (React)
- Backend Developer (Node.js)
- Web Application Developer

Questions, answered.

Q01

Do I need prior experience to join?

You should know JavaScript fundamentals, HTML and CSS. Prior React or Node.js experience is not required, as both are taught from the basics within this intermediate full-stack program.

Q02

How are classes scheduled and delivered?

Sessions are instructor-led and run as live virtual or blended batches, with weekday and weekend options where available. Each session combines concept walkthroughs, live coding and guided lab time, with recordings or notes shared for revision.

Q03

Will I receive a certificate?

Yes. Learners who complete the required labs, projects and final assessments receive the Samcommunity Academy SAM-MERN certificate. It is awarded on the basis of assessed work, not attendance alone.

Q04

What tools and lab access will I need?

You need a laptop with Node.js LTS, VS Code, Git, Docker Desktop and a free MongoDB Atlas account. Free tiers of hosting platforms are used for deployment labs.

Q05

Is career support included?

You get guidance on building a portfolio from your projects, resume and GitHub profile reviews, and mock technical interviews. We help you prepare and present your skills, but we do not guarantee jobs, placements or salary outcomes.



Let's talk

START MERN STACK FULL STACK.

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Learn practical skills. Grow with mentors.

Xylyn Samcommunity Private Limited · DPIIT-recognized startup · Surat, Gujarat, India