



Backend Development Course Syllabus



Duration: 4–6 Months



Schedule: 3 Days a Week | 2–3 Hours Per Day



Certificate: Yes (on completion)



By: SM TECH ACADEMY



Module 1: Introduction to Backend Development

- What is Backend Development?
 - Frontend vs Backend vs Full Stack
 - Understanding Client-Server Architecture
 - HTTP & HTTPS Protocols
 - REST API Basics
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Module 2: Programming Language – Core Python / Node.js / PHP (Choose One)

If Python:

- Python Basics: Data Types, Loops, Functions, File Handling
- Object-Oriented Programming in Python
- Exception Handling
- Modules and Packages

If Node.js (JavaScript):

- JavaScript Basics (for Backend)
- Node.js Core Concepts
- Event Loop, Callbacks, Promises, Async/Await
- File System, Buffers, Streams

If PHP:

- Syntax, Variables, Loops, Functions
- Superglobals (\$_GET, \$_POST, \$_SESSION)

- Form Handling
 - Error Handling
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Module 3: Database Management

- Relational DB: MySQL / PostgreSQL
 - NoSQL: MongoDB (Intro + Use Cases)
 - CRUD Operations
 - Relationships and Joins (for SQL)
 - Indexing and Optimization
 - ORM Tools: Sequelize (Node.js) / SQLAlchemy (Python) / Eloquent (PHP - Laravel)
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Module 4: Authentication & Authorization

- Sessions vs JWT
 - Login/Signup Implementation
 - OAuth2 / Google & Facebook Login
 - Middleware for Protected Routes
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Module 5: RESTful API Development

- CRUD APIs
 - Route Handling
 - Request & Response Cycle
 - Postman / Swagger for Testing
 - Error Handling in APIs
 - Rate Limiting and API Security
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Module 6: Frameworks

Based on Language Chosen:

- Python: Flask or Django

- Node.js: Express.js
- PHP: Laravel

Topics:

- Routing
 - MVC Pattern
 - Middleware
 - Template Engines
 - Session Handling
 - File Uploading
 - Email Integration
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Module 7: Hosting & Deployment

- Version Control with Git & GitHub
 - Deployment on:
 - cPanel
 - Heroku / Render
 - AWS EC2 or Lightsail
 - Nginx/Apache Setup (Basics)
 - Environment Variables
 - .env File and Security
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Module 8: Testing & Debugging

- Unit Testing
 - Postman/Newman for API Testing
 - Debugging Techniques
 - Logs & Monitoring
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Module 9: Performance & Security

- Caching (Redis, Memory Cache)
 - Database Optimization
 - API Rate Limiting
 - SQL Injection Prevention
 - CORS Handling
 - HTTPS & SSL Setup
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Module 10: Real-Time Features (Advanced)

- WebSockets & Socket.io (Node.js)
 - Django Channels (Python)
 - Chat Server / Notification Service
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Module 11: Project Work

Hands-on Projects based on real-world problems

- **Project 1:** Blog API System
 - **Project 2:** User Management System with Authentication
 - **Project 3:** E-commerce Backend (Cart, Orders, Products)
 - **Project 4 (Capstone):** Full-featured RESTful Backend with Admin Panel
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Extras

- Git & GitHub Mastery
- Resume & Portfolio Building
- Interview Preparation for Backend Roles