

Backend Development Course Syllabus

Total Duration: 180hrs

Module 1: Core Backend Development

Chapter 1: Backend Fundamentals & Setup

- MVC and MVT Architecture
- Project Folder Structures
- Routing Logic and Middleware
- Template Engines: Blade, Django Templates, EJS
- Local Development Environment Setup
- Git and GitHub Workflow
- Introduction to Unit Testing and Linters

Chapter 2: SQL Databases and ORM Integration

- Relational Database Concepts
- SQL Queries including JOINS, WHERE, GROUP BY
- Designing Tables and Defining Relationships
- CRUD Operations using ORM
- Database Migrations and Seeders
- Ensuring Data Integrity and Using Transactions

Chapter 3: REST API Development and Authentication

- Designing RESTful API Patterns
- Creating CRUD Routes with Validation
- Implementing Token-Based Authentication using JWT

- Securing Routes with Role-Based Protection
- Input Data Sanitization and Error Handling
- API Testing using Postman or Thunder Client

Module 2: Programming in Your Selected Language

Chapter 4: Choose Any one language

Python (Django / Flask)

- Project Setup and App Structure
- ORM using Django ORM or SQLAlchemy
- Advanced Model Relationships
- REST API Development using Django REST Framework or Flask-Restful
- JWT Authentication
- Django Admin Panel Customization
- File Upload Handling
- Local Deployment with PostgreSQL and Gunicorn

PHP (Laravel)

- Laravel Folder Structure and MVC Workflow
- Eloquent ORM and Database Relationships
- Authentication using Laravel Breeze or Jetstream
- API Resources and Resource Controllers
- API Authentication using Sanctum or Passport
- File Uploads and Storage Handling
- Middleware Creation and Form Validation
- Local Deployment Setup

JavaScript (Node.js + Express)

- Express.js Project Structure using MVC
- Sequelize ORM with SQL Associations
- Building RESTful APIs with Express
- JWT Authentication and Role-Based Access
- File Uploads using Multer
- Custom Middleware and Error Handling
- Local Deployment using Railway or Render

Module 3: File Handling & Deployment

Chapter 5: File Uploads, Optimization and Deployment

- Advanced File Handling and Directory Management
- File Type, Size, and Path Validation
- Managing Application Configuration using .env Files
- Logging, Debugging, and Error Tracking
- Introduction to Redis Caching for Optimization
- Deployment with Gunicorn, Nginx, and PostgreSQL for Python
- Deployment with Laravel Forge or Shared Hosting for PHP
- Deployment with PM2, Railway, or Render for Node.js

Chapter 6: Real-World Backend Features

- Role-Based Permissions and Access Control
- Background Job Processing with Celery, Laravel Queues, or Bull.js

- Implementing Pagination, Filtering, and Sorting in APIs
- API Documentation with Swagger or Redoc
- API Versioning for Long-Term Maintenance
- Security Best Practices including OWASP, CORS, and Rate Limiting

Chapter 7: Capstone Projects and Final Review

Build One of the Following:

- CMS (Content Management System)
- CRM (Customer Relationship Management)
- Inventory Management System
- Role-Based Admin Dashboard

Project Requirements:

- Authentication System with JWT and Role-Based Access
- SQL Database Integration with ORM
- Full REST API with CRUD, Filtering, and Pagination
- File Upload Handling for Media or Documents
- Admin and User Role Management
- API Documentation with Swagger or Postman
- Deployed Live Application
- Clean GitHub Repository

Final Deliverables:

- Final Project Presentation
- GitHub Repository Submission
- Live Hosted Project URL



- Course Completion Certificate

