AI-Powered Python Full-Stack Web Development

13-MODULE CURRICULUM

A comprehensive, project-driven training program designed to take you from programming fundamentals all the way to deploying intelligent, full-stack web applications. Each module builds on the last — combining Python mastery, modern frameworks, real databases, React frontends, and cutting-edge AI integration into one cohesive learning journey.



MODULE 1

Programming Fundamentals with Python

Every great developer starts with a rock-solid foundation. This module introduces you to the world of programming through Python — one of the most readable and powerful languages available — while weaving in AI-assisted coding tools from day one.

1

Environment Setup

Install Python, configure VS Code and Jupyter Notebooks, and get comfortable with your development environment before writing your first script.

2

Core Language Concepts

Master variables, data types, operators, conditional statements, loops, functions, and modules — the essential building blocks of every Python program.

3

Data Structures

Work hands-on with Lists, Tuples, Sets, and Dictionaries. Learn how to store, retrieve, and manipulate data effectively in real-world scenarios.

4

Robust Coding Practices

Tackle File Handling and Exception Handling to write code that handles edge cases gracefully. Use AI-powered tools for smarter debugging and code suggestions.

MODULE 2

Advanced Python

Once you have the basics down, it's time to level up. Module 2 dives into the advanced features that separate beginner coders from professional Python developers — from elegant functional programming tools to connecting with real-world APIs.

Advanced Language Features

- Object-Oriented Programming — Classes, Objects, Inheritance, and Polymorphism
- Lambda functions, Map, and Filter for concise, expressive code
- Decorators and Generators for powerful, reusable patterns
- Virtual Environments for clean, conflict-free project management

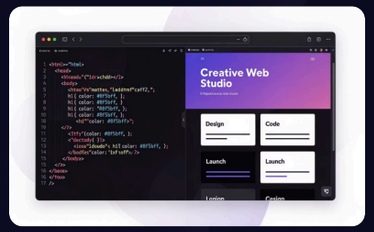
Real-World Connectivity

- Working with APIs using the **Requests Library** to pull live data from the web
- JSON Handling — parsing, generating, and transforming structured data
- Introduction to Automation — writing scripts that do repetitive tasks for you
- Leveraging AI tools to write optimized, production-quality code faster

MODULE 3

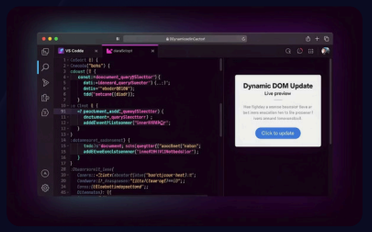
Frontend Development

Great applications need great interfaces. This module covers the complete frontend toolkit — from the structure of a webpage to responsive, mobile-friendly layouts — giving you the skills to build polished UIs that users love.



HTML5 & CSS3

Build semantic page structure with HTML5 and style it beautifully with CSS3 — including Flexbox, Grid, and responsive design techniques for all screen sizes.



JavaScript & DOM

Learn JavaScript fundamentals, manipulate the Document Object Model dynamically, and embrace modern ES6 concepts like arrow functions, destructuring, and modules.



Bootstrap Framework

Accelerate UI development using Bootstrap's powerful Grid System, pre-built components, and responsive utilities — shipping professional layouts in a fraction of the time.

MODULE 4

Version Control with Git & GitHub

Professional development is a team sport. Version control is the skill that ties every project together — enabling collaboration, safe experimentation, and confident deployment. This module makes Git and GitHub second nature.

01

Git Basics

Master the core workflow: **init**, **add**, **commit**. Learn to track changes, write meaningful commit messages, and maintain a clean project history.

02

Branching & Merging

Create feature branches to experiment safely, then merge changes back into the main codebase — resolving conflicts like a seasoned developer.

03

GitHub Collaboration

Push repositories to GitHub, open pull requests, review code, and follow industry-standard team collaboration workflows used at top tech companies worldwide.

04

Deployment via GitHub

Go from code to live application using GitHub-based deployment pipelines — a critical skill that bridges development and production environments.

MODULE 5

Django Framework — Backend Development

Django is Python's most powerful web framework, trusted by Instagram, Pinterest, and thousands of startups. This module takes you from your first Django project to building complete, database-backed web applications with authentication and admin capabilities.

Project Architecture

Understand Django's MVT pattern (Models, Views, Templates) and how apps, URL routing, and settings work together to form a clean, scalable project structure.

User Interaction

Handle forms and user input securely, implement Login and Registration with Django's built-in Authentication system, and manage the powerful Admin Panel.

Data & ORM

Perform full CRUD operations and query your database using Django ORM — writing expressive Python instead of raw SQL to interact with your data models.

MODULE 6

Django REST Framework — API Development

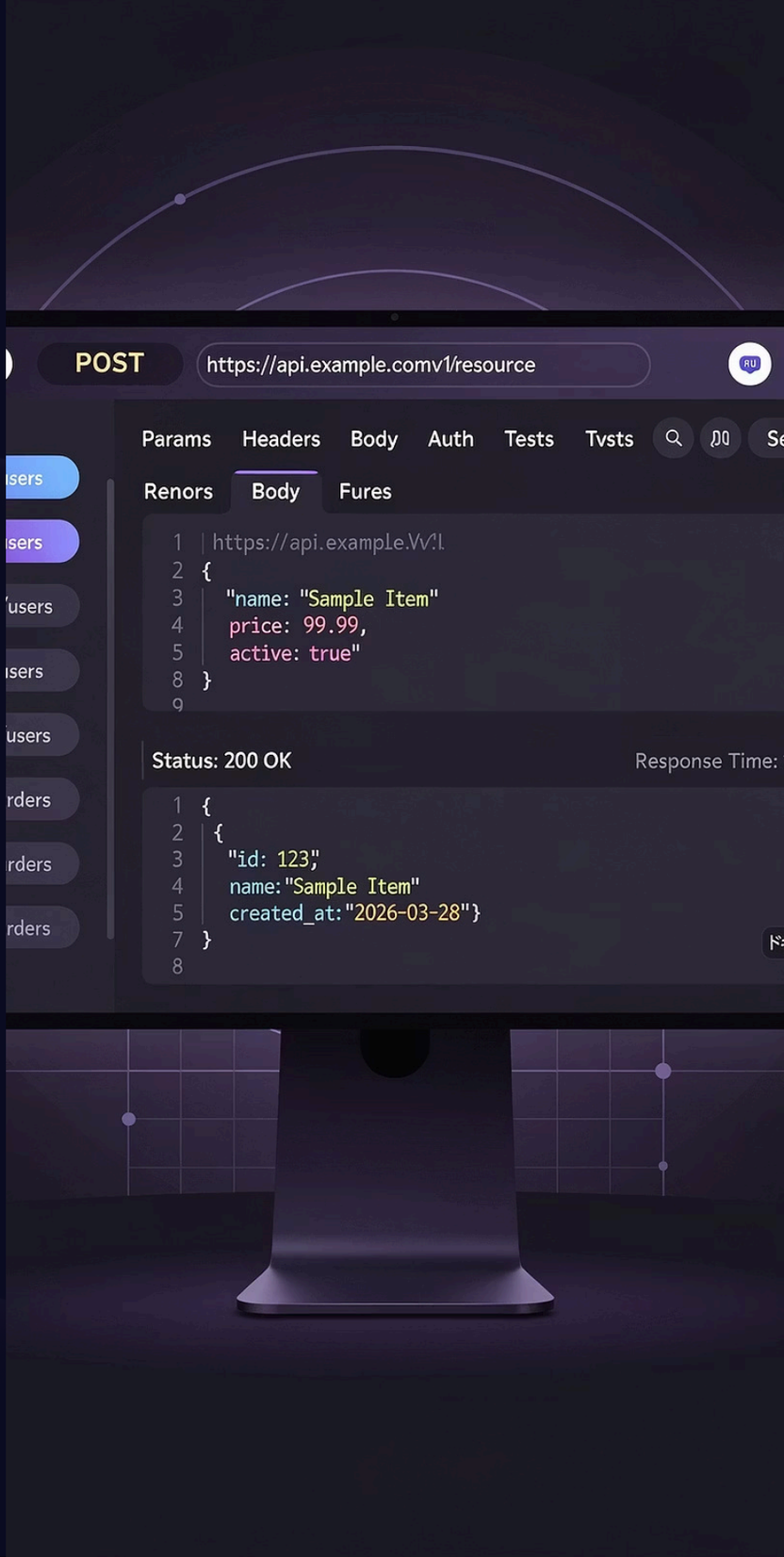
Modern web apps are powered by APIs. This module teaches you how to design, build, secure, and test RESTful APIs using Django REST Framework — the industry standard for Python-based backend services that connect to any frontend or mobile client.

Building the API

- Understand REST architecture principles and HTTP methods
- Create **Serializers** to convert complex data to JSON and back
- Build **API Views and ViewSets** for clean, reusable endpoints

Securing & Testing

- Implement **JWT and Token Authentication** to protect your API
- Test endpoints thoroughly with **Postman**
- Connect your Django API to a live frontend for full-stack integration



MODULE 7

Database Management

Data is at the heart of every application. This module gives you hands-on experience with both enterprise-grade relational databases and SQLite — ensuring you can design efficient schemas, write powerful queries, and integrate databases seamlessly into Django projects.

MySQL & PostgreSQL

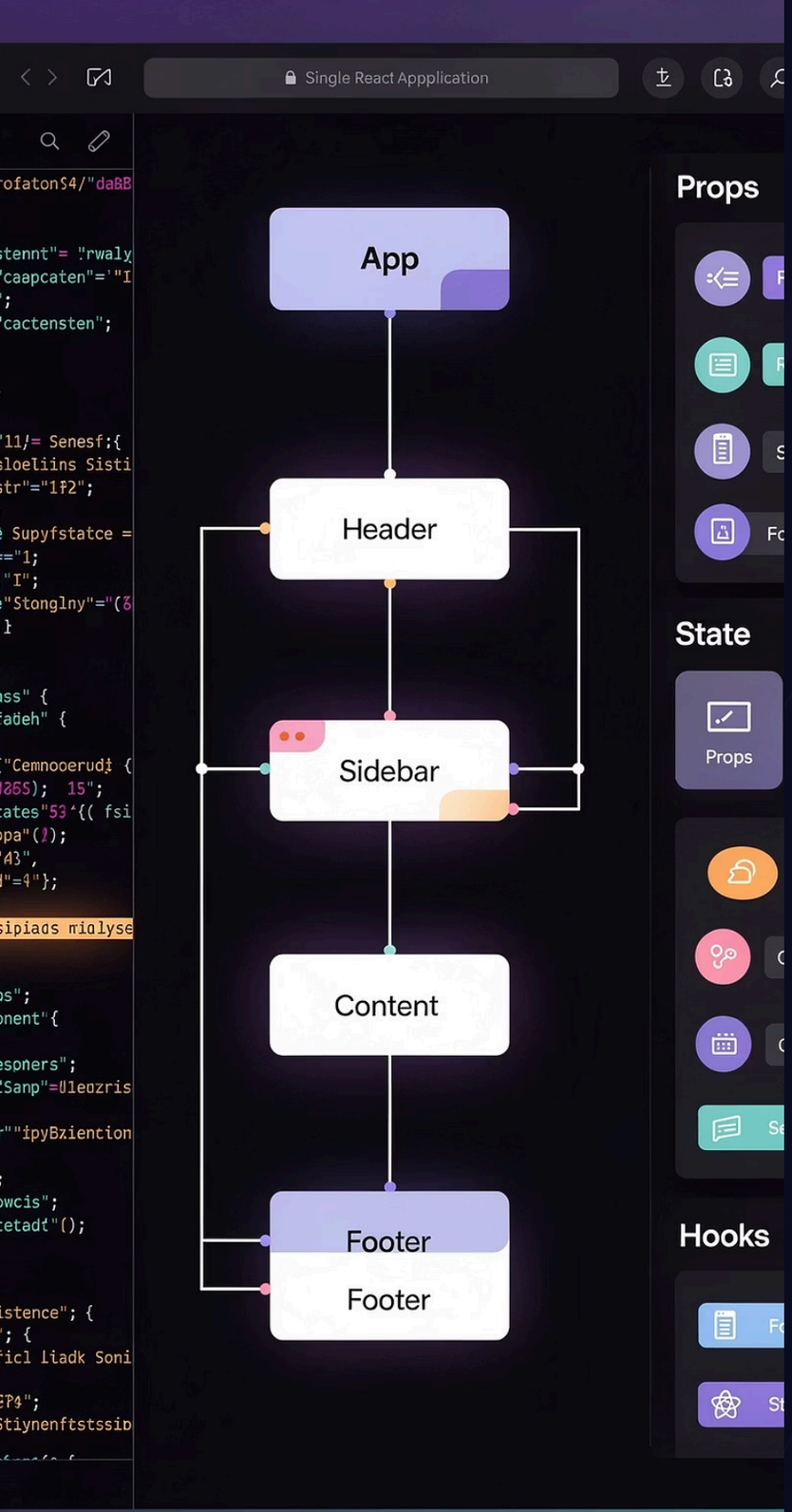
Design normalized database schemas, perform CRUD operations, and write advanced queries using **JOINs and Indexing** for performance. Integrate directly with Django models for a production-ready data layer.



SQLite — Django's Default

Use SQLite for rapid local development and smaller-scale projects. Understand when to use a lightweight embedded database versus a full server-based solution — and how to migrate between them.

Pro Tip: Understanding multiple database systems makes you a more versatile and hireable full-stack developer. Real-world projects often require switching between them.



MODULE 8

React JS — Frontend Integration

React is the world's most popular frontend library — used by Facebook, Airbnb, Netflix, and countless startups. This module equips you to build dynamic Single Page Applications (SPAs) and connect them to your Django backend for true full-stack capability.

React Foundations

Learn the component-based architecture of React, write JSX syntax, and understand how **Props and State** drive reactive, data-driven user interfaces.

Hooks & Routing

Use **useState** and **useEffect** hooks to manage component lifecycle and side effects. Implement **React Router** for seamless multi-page navigation within your SPA.

Full-Stack Integration

Connect your React frontend to Django REST APIs — fetching, posting, and rendering live data to create fully integrated, production-grade web applications.

⭐ HIGHLIGHT MODULE

AI Integration in Web Apps

This is where the course truly sets itself apart. Module 9 teaches you to embed the power of modern AI directly into your web applications — from chatbots to content generators — preparing you for the next generation of intelligent software.



AI APIs & Chatbots

Integrate leading AI APIs for text, image, and chat capabilities. Build fully functional AI chatbots embedded within your Django or React web apps.



Content Generation

Add AI-based content generation features — auto-writing tools, summaries, product descriptions — that create real value for users and differentiate your applications.



Recommendations & Prompts

Implement the basics of recommendation systems to personalize user experiences. Master **Prompt Engineering** techniques to get precise, useful outputs from AI models.

MODULE 10

Automation & Scripting

Why do manually what Python can do for you? This module teaches you to write powerful automation scripts that scrape the web, process data, and orchestrate intelligent workflows — skills that multiply your productivity and open up new freelance and career opportunities.

Web Scraping

Harvest data from any website using **BeautifulSoup** for static pages and **Selenium** for dynamic, JavaScript-rendered content.

Task Automation

Build scripts that automate repetitive tasks — file management, email notifications, scheduled jobs — saving hours of manual work every week.

Data Processing

Write robust data transformation and cleaning scripts to prepare raw datasets for use in web apps, reports, or machine learning pipelines.

AI-Powered Workflows

Combine automation with AI APIs to build intelligent pipelines — automatically classifying, summarizing, or generating content as part of a fully automated workflow.

MODULE 11

Deployment & DevOps Basics

Building an app is only half the journey — getting it live is what matters. This module covers everything you need to confidently deploy, manage, and maintain production web applications on real cloud infrastructure.



From managing environment variables and static file handling to setting up CI/CD pipelines and configuring a custom domain — you'll graduate this module with a publicly accessible, professionally deployed application to show potential employers or clients.

MODULE 12 — OPTIONAL

Mobile App Introduction

Your Django backend doesn't have to stop at the browser. This optional module introduces you to mobile development — showing how your existing API skills extend naturally into the mobile ecosystem using React Native and Flutter.

Mobile Frameworks Overview

Get an introductory look at **React Native** (JavaScript-based, great for React developers) and **Flutter** (Dart-based, Google's cross-platform toolkit). Understand the trade-offs between each approach and how to choose for your use case.

Backend Integration

Learn how mobile apps consume REST APIs — making authenticated requests, handling JSON responses, and rendering dynamic content. Connect your existing Django backend to a mobile frontend with minimal additional configuration, proving the true versatility of a well-built API.

MODULE 13

Live Projects — Industry Level

Everything you've learned comes together in Module 13. These are not toy exercises — they're portfolio-ready, industry-level projects that demonstrate your ability to deliver complete, deployed web applications. Impress employers, win clients, and prove your skills.



Blog Website

A full-featured Django blog with authentication, rich text posts, categories, and an admin panel — the classic full-stack project done right.



E-Commerce Website

Build a working online store with product listings, a shopping cart, order management, and payment-ready architecture using Django.



REST API Project

A standalone, documented REST API project built with Django REST Framework — ready to connect to any frontend, mobile, or third-party client.



Full-Stack App

The complete Django + React integration project — a modern SPA consuming a live Django API, demonstrating your command of the full development stack.



AI-Powered Web App

Your capstone: a live web application featuring an AI chatbot or content generator — the defining project that sets you apart in today's AI-driven job market.