

★ **Python Full-Stack Developer**

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**Module 1: Introduction to Full-Stack Development**

- What is full-stack development?
- Frontend vs Backend vs Database
- Why Python + Django for backend?
- How frontend + backend + database work together
- Tools setup: VS Code, Postman, Git, Python, Node.js

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**Module 2: Python Programming**

**Python Basics**

- Variables, Data types, Operators
- Conditions & Loops
- Input/output

**Functions**

- Arguments, return values
- Lambda functions

**Data Structures**

- Lists, Tuples, Dictionaries
- List comprehensions

**Object-Oriented Programming**

- Classes, Objects
- Inheritance & Polymorphism

**File Handling**

- JSON, CSV, Text files

**Error Handling**

- try/except
- Custom exceptions

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**Module 3: Databases**

- Create, Read, Update, Delete
- Joins
- Constraints
- Index basics

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**Module 4: Frontend Development**

**HTML5**

- Forms
- Semantic elements

**CSS3**

- Flexbox
- Grid
- Responsive design

**JavaScript (for React/AJAX)**

- ES6 basics
- async/await
- Fetch API

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**Module 5: React.js**

**React Essentials**

- Components
- Props & state
- Events
- Conditional rendering

**Hooks**

- useState
- useEffect

**Routing**

- React Router basic pages

**API Integration**

- Axios
- Handling forms
- Basic error handling

**UI Styling**

- Tailwind CSS
- Material UI (optional)

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**Module 6: Django – Backend Development**

**Django Fundamentals**

- Creating project & apps
- Templates
- URL routing
- Views
- Models & migrations
- Forms & ModelForms
- Admin panel

**User Authentication**

- Signup / Login
- Django auth system
- Permissions & groups

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**Module 7: Django REST Framework (DRF) –**

**API Development**

- What is REST API?
- Serializers
- API views
- ViewSets & Routers
- CRUD APIs
- Connecting frontend with backend
- JWT Authentication (Simple JWT)
- API permissions

- API testing with Postman

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## ■ **Module 8: Connecting Frontend (React) with Backend (Django API)**

- Handling API calls
- Login + Register with JWT
- Protected routes in React
- Saving user data
- CRUD with UI + API

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## ■ **Module 9: File Uploads & Media Handling**

- Image/file uploads in Django
- Upload preview in React
- Saving files to media folder
- Serving media files

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## ■ **Module 10: Deployment (Optional)**

### **Frontend Deployment**

- Deploy React app on Netlify or Vercel

### **Backend Deployment**

- Deploy Django API on Render
- Environment variables
- Debug vs Production settings

### **Database Deployment**

- PostgreSQL on Render / Railway

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## ■ **Module 11: Basic DevOps & Tools**

- Using Git & GitHub
- GitHub branches & PR
- Creating a simple CI pipeline
- Understanding Docker (Introduction Only)
- Basic Linux commands

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## ■ **Module 12: Capstone Project – Complete Full-Stack App**

Students build a full real-world app including:

### **Features:**

- User signup/login (JWT)
- Dashboard (React)
- CRUD operations
- Upload images/files
- Profile settings
- Search & filtering
- Pagination
- Deploy live on cloud

### **Example Projects:**

- E-Commerce Product Manager

- Job Portal
  - Blog Platform
  - Social Feed App
  - Student Management System
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