

PYTHON FULL STACK DEVELOPER

PROFESSIONAL SYLLABUS

MODULE 1: Python Programming (Core + Advanced)

1.1 Core Python Fundamentals

- **Introduction to Programming**
- **Installing Python & Virtual Environments**
- **Syntax, Variables, Datatypes**
- **Operators & Expressions**
- **Conditional Statements (if, elif, else)**
- **Loops (for, while)**
- **Functions (arguments, return values)**
- **Type Conversion**
- **Built-in Functions**
- **Math, Date & Time Modules**

1.2 Data Structures & Manipulation

- **Strings**
- **Lists, Tuples, Sets, Dictionaries**
- **Mutability & Immutability**
- **Map, Filter, Reduce**
- **Lambda Functions**

- **List / Dict / Set Comprehensions**

1.3 File & Error Handling

- **File operations (txt, json, csv)**
- **Exception Handling (try, except, raise)**
- **Custom Exceptions**
- **Logging & Debugging**

1.4 Python OOP (Advanced)

- **Classes & Objects**
- **Constructors**
- **Inheritance**
- **Polymorphism**
- **Encapsulation**
- **Abstract Classes**
- **Magic / Dunder Methods**

1.5 Advanced Python Concepts

- **Generators & Iterators**
- **Decorators**
- **Modules & Packages**
- **Virtual Environments**

- **Multithreading & Multiprocessing (Basics)**
- **Python Typing (Type Hints)**
- **Best Coding Practices (PEP-8, Docstrings)**

1.6 Python 3 Latest Updates

- **Walrus Operator**
- **Pattern Matching**
- **Enhanced Type Annotations**
- **Structural Pattern Matching**

MODULE 2: Databases (SQL + NoSQL)

2.1 Relational Database – MySQL / PostgreSQL

- **Database Design, ER Diagrams**
- **SQL Basics (DDL, DML, DCL, TCL)**
- **Constraints**
- **Joins (Inner, Left, Right, Full)**
- **Subqueries & Nested Queries**
- **Views & Indexing**
- **Functions & Stored Procedures**
- **Triggers**

2.2 NoSQL – MongoDB

- **Documents, Collections**
- **CRUD Operations**
- **Schema Design**
- **Aggregation Pipeline**
- **Operators & Indexing in MongoDB**

2.3 Python + Databases

- **mysql-connector / psycopg2**
- **CRUD with Python**

MODULE 3: Frontend Development

3.1 HTML5

- **Structure & Elements**
- **Forms & Validation**
- **Semantic Tags**
- **Media Integration (Audio/Video)**

3.2 CSS3

- **Selectors**
- **Flexbox**

- **CSS Grid**
- **Animations & Transitions**
- **Responsive Web Design**
- **Media Queries**
- **Bootstrap / TailwindCSS Framework**

3.3 JavaScript (ES6+)

- **Variables: let, const**
- **Arrow Functions**
- **Template Literals**
- **DOM Manipulation**
- **Events**
- **Promises**
- **Fetch API**
- **Async/Await**
- **Modules**
- **Error Handling**
- **JSON Handling**

MODULE 4: Modern Frontend Framework (React.js)

4.1 React Basics

- **Components & JSX**

- **Props & State**
- **Functional Components**
- **Styling in React**

4.2 React Advanced

- **React Hooks (useState, useEffect, useRef, useContext)**
- **Custom Hooks**
- **Routing (React Router)**
- **HTTP Calls using Axios**
- **State Management with Redux / Redux Toolkit**
- **Form Handling (Formik + Yup)**
- **Component Lifecycle Concepts**
- **Deployment of React App**

MODULE 5: Backend Development using Django

5.1 Django Core

- **MVC (MTV) Architecture**
- **Django Project Structure**
- **URL Routing**
- **Views (Function-Based & Class-Based)**
- **Templates & Template Filters**
- **Forms & ModelForms**
- **Static & Media Files**

- **Django Messaging Framework**

5.2 Django ORM

- **Models & Fields**
- **Migrations**
- **QuerySets**
- **Relationships (One-to-One, One-to-Many, Many-to-Many)**
- **Aggregations & Annotations**

5.3 Django Admin Customization

- **Admin Interface Setup**
- **Custom Admin Forms**
- **Permissions & Groups**
- **Admin Filters & Search**

5.4 Django REST Framework (DRF)

- **REST API Fundamentals**
- **Serializers (Normal / Nested / Model)**
- **API Views & ViewSets**
- **Routers**
- **Permissions & Authentication**

- **JWT Authentication (Django restframework-simplejwt)**
- **Pagination**
- **Filtering & Query Parameters**
- **File & Image Uploads**
- **Token-Based Authentication**
- **DRF Throttling**

MODULE 6: Version Control & Collaboration

Git & GitHub

- **Git Installation & Setup**
- **Branching Strategies**
- **Pull Requests & Merging**
- **Git Ignore**
- **Merge Conflicts Resolution**
- **GitHub Repository Management**
- **GitHub Actions (CI/CD Basics)**

MODULE 7: DevOps & Deployment Basics

7.1 Docker for Python Developers

- **Docker Architecture**

- **Docker Images & Containers**
 - **Docker Compose**
 - **Dockerizing Django + React Projects**
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7.2 CI/CD Pipelines

- **GitHub Actions**
 - **Automating Tests**
 - **Automated Deployments**
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7.3 Cloud Deployment

- **Render Deployment (Python + DB)**
- **Railway Deployment**
- **Frontend Deployment (Vercel / Netlify)**

MODULE 8: Soft Skills + Interview Preparation

- **Resume Building for Full Stack Developer**
- **GitHub Profile Optimization**
- **Coding Round Preparation**
- **SQL Interview Prep**
- **Python MCQs & Coding Problems**
- **System Design Fundamentals (Beginner level)**

MODULE 9: Major Hands-On Projects

Project 1 — Python + SQL CRUD App

Tech Stack: Python, MySQL, HTML/CSS/JS

- **Basic CRUD**
 - **Search, Sorting**
 - **Validation**
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Project 2 — REST API with Authentication

Tech Stack: Django REST Framework

- **JWT Auth**
 - **CRUD**
 - **Filtering, Pagination**
 - **Role-Based Access**
 - **Testing with Postman**
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Project 3 — Complete Full Stack Project

Frontend: React.js

Backend: Django / DRF

Database: MySQL / PostgreSQL

Features:

- **User Registration & Login**

- **JWT Authentication**
- **Role-Based Authorization**
- **CRUD Operations**
- **Image Upload**
- **Notifications / Email Sending**
- **Dashboard with Charts**
- **Reports (PDF / Excel)**
- **Payment Gateway Integration (Optional)**
- **Deployment on Cloud**
- **CI/CD Pipeline Setup**