**Python Full-Stack Developer Roadmap with DevOps (1-Year Plan)**

This roadmap balances **core Python**, **web development (frontend + backend)**, **cloud (AWS)**, and **containerization (Docker)**—ideal for a **modern Python developer or full-stack engineer**.

**🗓️ Month 1-2: Core Python Fundamentals**

**🔑 Goals:**

* Master Python syntax and write small programs
* Understand core programming principles

**✅ Topics:**

* Data types, variables, operators
* Conditionals, loops
* Functions
* Strings, Lists, Tuples, Dictionaries, Sets
* Exception Handling
* File Handling
* Pythonic code & list comprehensions

**🧪 Tools:**

* Python 3.x
* Jupyter Notebooks or VSCode
* venv, pip

**🧠 Practice:**

* HackerRank / LeetCode (Easy)
* Build: Calculator, Note-taker, To-do CLI app

**🗓️ Month 3: OOP + Modules + Standard Libraries**

**🔑 Goals:**

* Write scalable, reusable code

**✅ Topics:**

* Classes, Objects
* Inheritance, Polymorphism, Encapsulation
* Special Methods (\_\_init\_\_, \_\_str\_\_)
* Creating and using Modules
* Useful Libraries: os, datetime, random, math, collections, itertools

**💡 Mini Projects:**

* Bank Management System
* Library Inventory Tracker

**🗓️ Month 4: Data Structures, Algorithms, and Problem Solving**

**🔑 Goals:**

* Write optimized code and prepare for technical interviews

**✅ Topics:**

* Arrays, Lists, Stacks, Queues
* Hashmaps (Dictionaries)
* Trees, Graphs, Recursion
* Searching, Sorting
* Time/Space complexity (Big-O)

**🧠 Practice:**

* LeetCode / GeeksforGeeks / NeetCode

**🗓️ Month 5: Web Development – Backend with Flask or Django**

**🔑 Goals:**

* Build backend web services and REST APIs

**✅ Topics:**

* HTTP, REST, Routing
* Flask or Django (choose one)
* Templating (Jinja2)
* ORM (SQLAlchemy or Django ORM)
* Authentication & Authorization
* CRUD operations
* API development

**💡 Projects:**

* Blog API
* User Management System
* Notes App with Login

**🗓️ Month 6: Frontend – HTML, CSS, JavaScript + React**

**🔑 Goals:**

* Build dynamic, user-friendly interfaces

**✅ Topics:**

* HTML5 + Semantic Tags
* CSS3, Flexbox, Grid
* JavaScript (ES6+): Variables, Functions, DOM, Fetch API
* React.js basics: Components, Props, State, Hooks
* Integrate with your Flask/Django backend

**💡 Projects:**

* Todo App (React + Flask)
* Weather Dashboard (React + API)

**🗓️ Month 7: Database + Advanced Web**

**🔑 Goals:**

* Learn to store, retrieve, and secure data

**✅ Topics:**

* Relational DBs: MySQL or PostgreSQL
* NoSQL: MongoDB basics
* Advanced Django or Flask:
  + Class-based views
  + Middleware
  + API versioning
  + Pagination
* JWT, OAuth

**🧠 Tools:**

* psycopg2, SQLAlchemy, MongoEngine, Django REST Framework

**💡 Projects:**

* Blog with Comments and Auth
* Ecommerce REST API

**🗓️ Month 8: DevOps – Docker + Git + GitHub + CI/CD**

**🔑 Goals:**

* Learn to containerize and automate deployments

**✅ Topics:**

* Git basics: clone, commit, branch, merge
* GitHub Projects & Actions
* Docker:
  + Dockerfile
  + Images & Containers
  + Docker Compose
* CI/CD Pipelines using GitHub Actions
* Linting and Unit Testing (pytest, unittest)

**💡 Projects:**

* Dockerize Flask/Django + React App
* Setup GitHub CI/CD with Tests

**🗓️ Month 9: Cloud – AWS (Beginner to Intermediate)**

**🔑 Goals:**

* Deploy and scale apps using AWS

**✅ Topics:**

* EC2: Launch & connect via SSH
* S3: Store media/files
* RDS: Host MySQL/PostgreSQL
* IAM Roles, Security Groups
* Deploy Flask/Django app on EC2
* Elastic Beanstalk (optional)
* AWS Lambda (optional for serverless)

**💡 Projects:**

* Deploy a Portfolio site on EC2
* Upload & retrieve files from S3

**🗓️ Month 10: Specialization (Pick One)**

Choose based on your long-term goal:

**🔹 Web Full Stack (Advanced Django/Flask + React)**

* Full CRUD WebApp with Admin
* JWT Auth, Role-Based Access
* Pagination, Caching, Performance
* WebSocket/Chat Features

**🔹 Data Science & ML (with Python)**

* Pandas, NumPy, Matplotlib, Seaborn
* Scikit-learn, Jupyter
* Basic ML Models (Regression, Classification)
* Real Data Projects

**🔹 Automation/DevOps**

* Selenium for Web Automation
* Bash scripting + Python scripts
* Jenkins basics
* Infrastructure as Code (Terraform basic)

**🗓️ Month 11: Capstone Project**

**💥 Goals:**

* Build a full production-ready app that showcases your skills

**Examples:**

* Full-stack E-commerce App (React + Django + PostgreSQL)
* Task Manager with File Upload (Flask + S3 + EC2 + Docker)
* Resume Classifier using ML (Pandas + Scikit-learn + Flask API)

Include:

* Frontend
* Backend REST API
* Dockerized
* AWS Deployment
* Testing
* GitHub Actions

**🗓️ Month 12: Resume + Interview Prep + Portfolio + Job Hunt**

**🔑 Goals:**

* Be job-ready

**✅ Tasks:**

* Build GitHub Profile & Pin 3 Best Projects
* Build a Developer Portfolio Website (React or static HTML)
* Resume & LinkedIn Optimization
* Practice 50+ Python + DSA Interview Questions
* Mock Interviews

**Resources:**

* LeetCode Top 75
* System Design Basics (for backend roles)
* Real Job Postings (study requirements)

**🧰 Tools & Technologies Summary**

| **Category** | **Tools & Frameworks** |
| --- | --- |
| Core Python | Python 3.x, pip, venv, Jupyter |
| Backend | Flask, Django, Django REST, SQLAlchemy |
| Frontend | HTML, CSS, JavaScript, React.js |
| Database | SQLite, PostgreSQL, MySQL, MongoDB |
| DevOps | Git, GitHub, Docker, CI/CD |
| Cloud | AWS EC2, S3, RDS, IAM |
| Testing | pytest, unittest, Postman, Swagger |
| Deployment | Docker Hub, Render, AWS, Heroku |