

PYTHON DEVELOPMENT COURSE SYLLABUS

Module 1

Introduction to Python Programming

- Python setup, syntax, indentation, input/output handling
- Variables, constants, data types, type casting, operators
- Control flow: if-else, loops (for, while, nested, break, continue, pass)
- Best practices for writing clean, readable, and efficient Python code

Module 2

Functions, Modules & OOP in Python

- Functions, arguments (*args, **kwargs), scope, lambda functions
- Modules, packages, pip usage, and reusable code design
- OOP concepts: classes, objects, inheritance, encapsulation, polymorphism
- Special methods (init, destructors, magic methods) and abstraction

Module 3

File Handling & Exception Management

- File operations: read, write, append, modes (r, w, a, rb, wb)
- Working with text, CSV, and JSON files
- Exception handling: try-except, finally, multiple exceptions
- User-defined exceptions and error handling best practices

Module 4

Data Structures & Algorithms in Python

- Lists, tuples, sets, and dictionaries with comprehension techniques
- Stacks, queues, priority queues, and deque implementation
- Searching & sorting algorithms (linear, binary, bubble, merge, quicksort)
- Algorithmic problem-solving with time complexity (Big-O basics)

Module 5

Working with APIs & Databases

- RESTful APIs and requests handling (GET, POST, PUT, DELETE)
- Parsing and validating API responses (JSON/XML)
- Database integration with MySQL/SQLite (CRUD operations)
- ORM basics (SQLAlchemy) and transaction handling

Module 6

Python for Web Development

- Flask framework: routes, templates, forms, sessions, cookies
- Database integration and authentication in Flask
- Django framework: MVT architecture, ORM, migrations
- Building scalable web applications with Flask & Django



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Module 7

Python for Automation & Scripting

- Automating files, folders, and Excel/CSV tasks
- Web scraping with BeautifulSoup and Requests
- Browser automation with Selenium for testing and tasks
- Automating emails, schedulers, and small productivity scripts

Module 8

Version Control with Git & GitHub

- Git basics: init, clone, add, commit, push, pull, merge
- Branching, merging, and conflict resolution
- GitHub collaboration: repositories, forks, pull requests
- GitHub Actions and CI/CD basics for project automation

Module 9

Real-World Projects & Mini-Assignments

- Beginner projects: calculator, to-do list, file manager
- Web scraping project with data storage in CSV/DB
- Flask mini project (blog app) & Django project (e-commerce)
- Automation & data analysis projects for resume portfolio

