

Full Stack Web Development with Python

Duration: 20 days

Prerequisites: Knowledge of Web Application Development and Any Programming Language

Tools: Python, MY SQL, HTML, CSS, JS, Django, DRF, GIT

Day 1: Python Fundamentals & Control Structures

Topics:

- Overview of Full Stack Development
- Installing Python & IDEs (VS Code, PyCharm)
- Variables, Data Types, Type Conversion
- Input/Output, Print Formatting
- Operators (Arithmetic, Comparison, Logical)
- Conditional Statements (if-else, nested if)
- Loops (for, while, nested loops)
- range(), enumerate(), zip()

Labs:

- Age group categorizer
 - Prime number checker
 - Multiplication table generator
 - Number guessing game
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Day 2: Data Structures & Built-in Functions

Topics:

- Lists: operations, methods, nested lists
- Tuples: immutability, indexing
- Sets: uniqueness, set operations
- Dictionaries: keys/values, nesting, methods
- Membership and identity operators
- List comprehensions & dictionary comprehensions
- Built-in functions: len(), max(), sum(), etc.

Labs:

- Student database (dictionary of lists)
 - Product inventory manager
 - Word frequency counter in a paragraph
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Day 3: Functions, Modules, File Handling

Topics:

- Defining and calling functions

- Function arguments: default, keyword, *args, **kwargs
- Return statements, scope, global/local variables
- File handling: open, read, write, append, context manager
- Creating and importing modules
- Standard libraries: math, os, random, datetime

Labs:

- To-do list stored in a file
 - Password generator module
 - Calendar planner using datetime
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Day 4: OOP in Python

Topics:

- Object-Oriented Programming overview
- Classes, Objects, __init__ method
- Instance vs class variables/methods
- Inheritance, Multilevel Inheritance
- Polymorphism, Method Overriding
- Special methods: __str__, __len__, __repr__
- Exception handling (try-except-finally, raise)

Labs:

- Employee management using classes
 - Vehicle model hierarchy (inheritance)
 - Library system with exception handling
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Day 5: HTML5 – Page Structure & Forms

Topics:

- HTML document structure & DOCTYPE
- Tags: headings, paragraphs, images, links
- Lists: ordered, unordered, nested
- Tables: rows, colspan, rowspan
- Forms: input types, validation attributes
- Semantic tags: section, article, aside, footer

Labs:

- Personal portfolio webpage
 - Registration form with validation
 - Product listing with images in a table
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Day 6: CSS3 – Styling and Layout

Topics:

- Inline, internal, external styles
- Selectors: class, ID, pseudo-classes
- Box model: margin, padding, border
- Layouts: Flexbox, Grid, Positioning
- Transitions, shadows, backgrounds
- Responsive Design using Media Queries

Labs:

- Style the Day 5 portfolio page
 - Responsive pricing table
 - Flexbox-based navigation bar
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Day 7: JavaScript Essentials**Topics:**

- JavaScript syntax & data types
- Variables (var, let, const)
- Operators and expressions
- Functions, events, DOM manipulation
- Conditional logic and loops
- Built-in methods (Array, String)

Labs:

- Interactive contact form with validation
 - Simple calculator
 - DOM-based image gallery toggler
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Day 8: Python Intermediate + Virtual Environment**Topics:**

- Lambda functions, map(), filter(), reduce()
- zip(), enumerate(), sorted(), any()/all()
- Virtual environments using venv
- Installing packages with pip
- Creating requirements.txt
- Basics of unit testing with unittest

Labs:

- CSV reader/writer tool
 - Project scaffold with modules and venv
 - Unit tests for utility functions
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Day 9: Django Introduction & Project Setup

Topics:

- What is Django? MVT vs MVC
- Project & App structure
- URL routing and path()
- Views: function-based and template rendering
- Templates and template inheritance
- Static files management (CSS, JS)

Labs:

- Setup “Quote App” with 3 pages
 - Create and render context-based views
 - Use static CSS in template
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Day 10: Django Models, ORM, Admin Panel

Topics:

- Creating models and model fields
- Running migrations
- Model relationships (ForeignKey, OneToOne)
- Django admin: registration and customization
- Django shell: ORM operations

Labs:

- Product and Category model with admin interface
 - Add image field and description
 - Admin filters, search, and inline editing
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Day 11: Forms, Validations & Messages

Topics:

- Django Form class
- ModelForm with validation
- Input widgets and customizations
- CSRF protection
- Messages framework for feedback

Labs:

- User signup form using ModelForm
 - Bootstrap-styled feedback forms
 - Message display after submit
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Day 12: Static/Media Files & Django Authentication

Topics:

- Managing static and media files
- ImageField and FileField
- Django User model, Login, Logout, Signup
- @login_required, Sessions & context processors

Labs:

- Profile uploader with media files
 - User login/logout with custom UI
 - Authenticated dashboard
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Day 13: Django Project – Blog/Product Management

Topics:

- Designing full CRUD project
- Handling comments and likes
- Using Django's Q object for search
- Advanced form rendering with crispy-forms

Labs:

- Complete blog system with images
 - Product management app with categories
 - Search/filter products by name/category
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Day 14: REST API Basics with Django REST Framework

Topics:

- REST principles and architecture
- Installing and configuring DRF
- Serializers: basic & ModelSerializer
- Function-based API views
- Testing APIs with Postman

Labs:

- Product list and detail APIs
 - Create/update/delete API using Postman
 - Return custom messages and status codes
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Day 15: DRF ViewSets, Auth & Permissions

Topics:

- ViewSets and Routers
- Pagination, Filtering, Ordering
- Token authentication
- Permissions (IsAuthenticated, custom)

Labs:

- Secure product API with login token
 - Add filters for search
 - Create custom permission for superuser
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Day 16: API Integration with JavaScript

Topics:

- Fetch API in JavaScript
- GET and POST requests
- Handling JSON response
- Error handling and retries

Labs:

- Fetch product list and render in HTML
 - Submit form data via JS to Django API
 - Live product search with debounce
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Day 17: MySQL with Django

Topics:

- Installing MySQL and GUI tools (MySQL Workbench)
- Setting up MySQL database
- Django settings configuration
- Migrations in MySQL
- ORM optimization: select_related, prefetch_related

Labs:

- Switch project from SQLite to MySQL
 - Create indexes and FK constraints
 - Performance testing of queries
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Day 18: Git, GitHub & Deployment Basics

Topics:

- Git basics: clone, commit, push, pull, branches
- Linking GitHub repository
- Managing .env files and environment variables

- Deployment on Render/Heroku/Railway

Labs:

- Push Django project to GitHub
 - Create .env and hide secrets
 - Deploy Django app and access live
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Day 19: Final Capstone Project – Development

Topics:

- Project planning (Idea, Features, Models)
- Setup full CRUD with Django and DRF
- MySQL integration
- Frontend integration (HTML/JS)

Labs:

- Build all backend features (API + admin)
 - Frontend forms and templates
 - Auth, session, and image uploads
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Day 20: Final Capstone Project – Completion & Presentation

Topics:

- Code cleanup and refactoring
- Final testing and QA
- Documentation and README writing
- Demo

Labs:

- Final commit and GitHub push