

Syllabus

Month 1: Fundamentals and Basic API Development

- Week 1-2: Python Fundamentals
- Week 3: Data Manipulation with NumPy and Pandas
- Week 4: Introduction to FastAPI

Days	Topics	Practice
Day 1	Python Basics - Data Types and Control Structures	Simple Calculator
Day 2	Python Built-in Data structures	A To-Do App
Day 3	Functions and Error Handling	Function to calculate the factorial of a number and handle invalid inputs
Day 4	Modules and Packages	Create a package with two modules and use both in a script.
Day 5	Introduction to OOP	A class for a bank account with methods to deposit, withdraw, and check balance
Day 6	Pillars of OOP	Implement inheritance for different types of accounts (e.g., savings, checking) in the above bank account task.
Day 7	Setting Up Development Environment and Version Control with Git	Push the bank account project to GitHub
Day 8	File Handling in Python	Program that reads a text file and counts the number of words, lines, and characters
Day 9	Introduction to Regular Expressions	Validates email addresses using regular expressions
Day 10	Introduction to Debugging and Testing	Write unit tests for the bank account project to ensure all methods work correctly
Day 11	Introduction to Numpy	Basic operations on an array
Day 12	Introduction to Pandas	Load a CSV file into a DataFrame, perform basic data manipulations such as filtering rows and computing summary statistics
Day 13	Advanced Pandas Operations	Analyze a sales dataset to calculate total sales by region and identify trends over time
Day 14	Working with Different File Formats	Convert a JSON file to a CSV file and vice versa using Pandas

Day 15	Combining and Merging Datasets	Merge sales and customer datasets to generate a comprehensive report
Day 16	Setting Up FastAPI and Understanding Its Structure	Develop a Hello World FastAPI application with a simple endpoint.
Day 17	Creating Basic Endpoints and Handling CRUD Operations	Create endpoints to manage a book catalog with basic CRUD operations
Day 18	Request Validation and Error Handling in FastAPI	Implement input validation for the book catalog endpoints and handle common errors
Day 19	Dependency Injection in FastAPI	Implement dependency injection to handle database connections in the book catalog API
Day 20	Advanced FastAPI Features - Background Tasks and WebSockets	Develop a chat application using FastAPI and WebSockets
Day 21	Security and Authentication in FastAPI	Add user login and registration to the book catalog API using OAuth2
Day 22	Deployment and CI/CD for FastAPI Applications	Deploy the book catalog API to a cloud platform using Docker and a CI/CD pipeline
Day 23	Optional (Serving Static Files and Templates)	Develop a simple web application with FastAPI that serves static HTML files

Month 2: Intermediate API Development and Database Management

- Week 1: Advanced FastAPI Features
- Week 2: Database Management with PostgreSQL
- Week 3: Integrating AI APIs
- Week 4: Advanced Topics in AI API Integration

Days	Topics	Practice
Day 1	Creating Background Tasks and Managing Dependencies	Create a background task to send email notifications when a new book is added
Day 2	Implementing Pagination for Large Datasets	Implement pagination for the book catalog API
Day 3	Introduction to PostgreSQL and Basic SQL Commands	Execute basic SQL queries on a sample database
Day 4	Integrating PostgreSQL with FastAPI	Integrate PostgreSQL with the book catalog API
Day 5	Database Indexing and Query Optimization	Optimize queries for the book catalog API using indexing

Day 6	Advanced SQL Features (JOINS, subqueries, and window functions)	Write complex queries to generate reports from the book catalog database
Day 7	Designing and Implementing a Relational Database Schema	Design a schema for a library management system
Day 8	Basics of RESTful APIs and How to Consume Them in Python	Consume a public REST API (e.g., OpenWeatherMap) and display weather information
Day 9	Introduction to OpenAI API	Create a simple application that generates text based on a prompt using the OpenAI API
Day 10	Advanced OpenAI API Usage	Develop an application that summarizes, translate, classify long texts using the OpenAI API.
Day 11	Integrating AI APIs with FastAPI	Develop a chatbot using FastAPI and the OpenAI API for multiple tasks.
Day 12	Advanced AI APIs for NLP and Image Processing	<ul style="list-style-type: none"> • Hugging Face Transformers • Google Cloud Natural Language API • OpenAI API • Microsoft Azure Computer Vision API
Day 13	Speech Recognition and Machine Learning Model Deployment with FastAPI	<ul style="list-style-type: none"> • Google Cloud Speech-to-Text API • Amazon Transcribe
Day 14	Monitoring and Maintaining Machine Learning Models	Implement monitoring for the house price prediction model to track performance