Advanced Python Course Catalog – 90 Days

Day	Module	Topics Covered
1-3	Review of Python Basics	Recap of Python Syntax, Data Types, Variables, Loops, Functions, Control Flow, List Comprehensions
4-6	Advanced Data Structures	Sets, Dictionaries, Tuples, Named Tuples, Defaultdict, OrderedDict, Heapq
7-9	Object-Oriented Programming (OOP)	Classes and Objects, Inheritance, Polymorphism, Encapsulation, Abstract Classes, Magic Methods
10-12	Advanced Functions	Lambda Functions, Closures, Decorators, Higher-Order Functions, Generators, Yield Statement
13-15	Working with Files	File Handling (Reading, Writing, Appending), CSV Files, JSON, XML Parsing, File Compression (gzip, zip)
16-18	Error Handling & Exceptions	try, except, finally, Custom Exceptions, Exception Hierarchy, Logging, Debugging
19-21	Iterators and Iterables	Iterators, Iterable Objects, Generator Expressions, Itertools Module
22-24	Context Managers	Using `with` statement, Creating Custom Context Managers, Managing Resources Efficiently
25-27	Regular Expressions (Regex)	Introduction to Regex, Pattern Matching, Substitutions, Flags, Regex Syntax and Functions
28-30	Multithreading and Multiprocessing	Threading Basics, Thread Synchronization, Multiprocessing, Managing Processes, Queue Handling
31-33	Asyncio and Asynchronous Programming	Understanding Asynchronous Programming, `asyncio` Module, Event Loop, Coroutines, Futures, Await
34-36	Python Networking	Sockets, Client-Server Architecture, Networking Libraries (socket, urllib, requests), HTTP Requests
37-39	Working with Databases	SQLite, SQLAlchemy, ORM, Database Queries, Transactions, Database Connections
40-42	Web Scraping	BeautifulSoup, Scrapy, Web Crawling, Data Extraction, Handling HTTP Requests, Handling CAPTCHAs
43-45	GUI Programming	Tkinter, PyQt, Creating GUI Applications, Event Handling, Widgets, Layouts, Working with Images and Files
46-48	Testing & Unit Testing	Unit Testing with `unittest`, Mocking, Assertions, Test-Driven Development (TDD), PyTest
49-51	Python Design Patterns	Creational, Structural, Behavioral Patterns, Singleton, Factory, Strategy, Observer
52-54	Python Performance Optimization	Profiling with `cProfile`, Memory Profiling, Code Optimization, Using Cython, JIT Compilation
55-57	Metaprogramming	Introduction to Metaprogramming, Dynamic Class Creation, Modifying Functions/Classes at Runtime

Day	Module	Topics Covered
58-60	**Working with APIs**	API Authentication, REST APIs, JSON Parsing, Creating and Consuming APIs, Handling Errors in APIs
61-63	**Advanced Libraries**	NumPy Advanced Techniques, Pandas Advanced Operations, Matplotlib for Data Visualization, Plotly, Seaborn
64-66	**Machine Learning with Python**	Introduction to Scikit-Learn, Supervised vs Unsupervised Learning, Data Preprocessing, Regression, Classification
67-69	**Deep Learning with Python**	TensorFlow Basics, Keras, Neural Networks, Training and Evaluating Models, CNN, RNN
70-72	**Natural Language Processing (NLP)**	Text Preprocessing, NLTK, Spacy, Sentiment Analysis, Text Classification, Named Entity Recognition
73-75	**Data Science & Big Data with Python**	Data Collection, Preprocessing, Analysis, Big Data Frameworks (PySpark, Dask), Data Visualization Techniques
76-78	**Cloud Computing with Python**	AWS SDK (Boto3), Google Cloud SDK, Azure SDK, Cloud Storage, Lambda Functions, Cloud Databases
79-81	**Web Development with Flask**	Introduction to Flask, Building Web Applications, RESTful APIs, Templates, Jinja, Flask-SQLAlchemy
82-84	**Django Framework**	Introduction to Django, MVC Architecture, Models, Views, Templates, Admin Interface, Django REST Framework
85-87	**Security and Cryptography**	Hashing, Encryption/Decryption, Working with SSL/TLS, Secure Coding Practices, Cryptography Libraries (PyCryptodome)
88-89	**Building Python Projects**	Building a Web App, API Integration, Data Analytics Application, Machine Learning Model Deployment
90	**Final Project & Certification**	Full-stack Python Project, Review Key Concepts, Final Exam & Certification