

Diploma in Python (6 Months)

Duration: 6 Months (~240 Hours)

Mode: Live Online / Classroom

Designation after completion: Python Full-Stack Professional (Developer + Specialist)

Tools & Technologies: Python 3.x, Jupyter/Anaconda, PyCharm/VS Code, GitHub, Numpy, Pandas, Matplotlib, Seaborn, SQLAlchemy, PySpark, TensorFlow/PyTorch

Certifications prepared: PCAP – Certified Associate in Python Programming, PCPP – Professional Python Programmer, DataCamp/Coursera Data Analyst with Python, AWS Certified Data Engineer (for Data Engg), TensorFlow Developer Certificate (for AI/ML)

Course Syllabus (24 Weeks)

Week 1–2

- Installation & setup (Anaconda, VS Code, PyCharm)
- Syntax, variables, operators, data types
- Control structures (if, loops)
- Assignment: Simple scripts, BMI Calculator

Week 3–4

- Functions & arguments
- String operations & regex basics
- File handling & exceptions
- Assignment: Student grading system, File manager
- Mock Interview 1

Week 5–6

- Lists, tuples, sets, dictionaries
- Nested structures & comprehensions
- Modules & packages
- Assignment: Contact book, Student marksheet

Week 7–8

- Classes & objects, methods, constructors
- Encapsulation & inheritance
- Polymorphism, abstract classes
- Assignment: Banking System, Inheritance models
- Mock Interview 2

Week 9–10

- Decorators, generators, iterators

- Context managers, custom exceptions
- Logging & debugging techniques
- Assignment: Custom iterator, Log Analyzer

Week 11–12

- Multithreading & multiprocessing
- Async programming with asyncio
- Design patterns: Singleton, Factory, Observer
- Assignment: Async scraper, Observer pattern project
- Mock Interview 3

Specialization Tracks (Choose One)

Option 1: Data Analysis

Week 13–14

- Numpy & Pandas for structured data
- Assignment: Weather dataset analysis

Week 15–16

- Data cleaning & transformation (missing values, joins, pivots)
- Assignment: HR dataset transform

Week 17–18

- Exploratory Data Analysis, visualization with Matplotlib/Seaborn
- Assignment: Banking dataset EDA

Week 19–20

- Time-series basics, stock market case study
- Assignment: Stock dataset project

Week 21–22

- Business case studies (Sales, HR, Banking datasets)
- Assignment: Business insights report

Week 23–24

- Capstone Project: Market Trend Dashboard
- Mock Interview 4

Option 2: Data Engineering

Week 13–14

- ETL basics with Python (CSV, JSON, XML)
- Assignment: CSV → JSON converter

Week 15–16

- Database integration with SQLAlchemy
- CRUD operations
- Assignment: Employee DB queries

Week 17–18

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- PySpark basics: DataFrames, transformations
 - Assignment: Big dataset processing

Week 19–20

- PySpark SQL (joins, aggregations)
- Assignment: Sales joins

Week 21–22

- Workflow orchestration with Airflow, Kafka streaming
- Assignment: ETL DAG

Week 23–24

- Capstone Project: End-to-End Cloud ETL Pipeline
- Mock Interview 4

Option 3: AI & ML

Week 13–14

- Scikit-learn basics, Regression models
- Assignment: Salary prediction

Week 15–16

- Classification & Clustering models
- Assignment: Iris classifier, Customer segmentation

Week 17–18

- Neural Networks basics, TensorFlow/PyTorch intro
- Assignment: Build ANN

Week 19–20

- CNNs & NLP basics
- Assignment: MNIST digit classifier, Text preprocessing

Week 21–22

- Advanced NLP (Spacy, embeddings), Chatbots
- Assignment: Mini chatbot

Week 23–24

- Capstone Project: Sentiment Analysis & Image Classifier
- Mock Interview 4