

PYTHON ANALYTICS TRAINING

Complete Practical • Real-time • Job-Oriented Curriculum

From Python Fundamentals to Data Handling, Pandas, NumPy, SQL Integration, Transformations & Real-time Analytics

Course Overview

Python is widely used across Data Analytics, Data Engineering, Data Science and AI workflows. This curriculum builds practical Python skills from the fundamentals and progressively moves into data structures, file handling, Pandas/NumPy dataframes, SQL database access, transformations, functions, object-oriented programming, regular expressions and a real-time Banking / Finance analytics case study.

START FROM FUNDAMENTALS Python setup, architecture, syntax and core programming	**WORK WITH REAL DATA** Files, Dataframes, Pandas, NumPy and SQL databases	**TRANSFORM & ANALYZE** Cleaning, joins, date/time processing and reusable functions
BUILD PROGRAMMING DEPTH Functions, lambda, classes, objects and regular expressions	**USE AI ASSISTANCE** AI-assisted debugging is introduced during practical coding	**APPLY IN A CASE STUDY** Banking / Finance scenario focused on data analysis

Who Can Enroll?

- Beginners who want to build a strong foundation in Python for data work
- Aspiring Data Analysts who need Python for data preparation and analysis
- Data Engineers who want Python skills for file, database and transformation workflows
- Professionals working with SQL who want to add Python-based data processing skills
- Learners preparing for Data Science / AI pathways who need practical Python fundamentals

Learning Outcomes

- Understand how Python executes code and how common development environments are used
- Write Python programs using variables, operators, data types, conditions and loops
- Create and manipulate Pandas dataframes and use NumPy for data-oriented tasks
- Connect Python with SQL databases and execute DDL/DML and analytical queries
- Clean, combine, join and transform datasets using practical dataframe operations
- Build reusable functions and apply lambda, recursion and object-oriented concepts
- Use regular expressions for text matching and extraction
- Apply the complete workflow in a real-time Banking / Finance analytics case study

Job-Relevant Skill Mapping

- **Data Analyst:** data cleaning, dataframe analysis, SQL access, transformations and case-study practice
- **Data Engineer:** Python data & file handling, database integration and data transformation patterns
- **Data Science / AI Foundation:** Python Programming, NumPy/Pandas, functions and data handling
- **Data Architect:** Database skills with Python connectivity, dataframes and transformations

Detailed Course Curriculum

Ch 1: Python Intro, Installations

- ✓ **Python Introduction, Python Versions**
- ✓ **Python Realtime Usage, Job Roles**
- ✓ **Python Installations: CLI, Anaconda**

Ch 2: Python Basics, Notebooks

- ✓ **Python Notebooks, Jupyter IDE**
- ✓ **Python print(), Examples**
- ✓ **Python display(), Examples**
- ✓ **Multi Line display**

Ch 3: Python Execution Architecture

- ✓ **Python Execution Architecture.**
- ✓ **Compiler, Byte Code & Interpreter**
- ✓ **cPython, Python Virtual Machine**
- ✓ **Python Syntax, RunTime Errors**

Ch 4: Python Variables

- ✓ **Variable Declarations, Rules**
- ✓ **Multi Value Variables, Type Casting**

- ✓ **Common Values, Multi Value Variables**

Ch 5: Python Operators

- ✓ **Athematic, String, Compare Operators**
- ✓ **Bit, Comparison, Logical Operators**
- ✓ **Binary, Membership, Format, Index Operators**

Ch 6: Python Data Types

- ✓ **Numeric, String, Sequence Data Types**
- ✓ **Type Casting, String Operators**
- ✓ **Variables with Conditions, Data Type Detection**

Ch 7: Python Lists

- ✓ **Python Lists, List Items, Slicing, Indexing Options**
- ✓ **Length & Type, Empty Lists, Append, List Edits**
- ✓ **Type Verification, list() Constructor, Out Of Range**

Ch 8: Python Dictionaries

- ✓ **Creating & Using Dictionaries. Indexing Dictionaries**
- ✓ **Edit Key Values, Lists inside Dictionaries**
- ✓ **Delete & Clear Functions. Unknown Values, Remove All**

Ch 9: Python Tuples

- ✓ **Python Tuples. Defining, Indexing Tuples**
- ✓ **Length(), Type(), Edit Tuples using Lists**
- ✓ **Mixed Values in Tuples, Range and Slicing**

Ch 10: Python Control Statements

- ✓ **If..Else Conditions, Variables & Expressions**
- ✓ **if..elif..else Conditions, Range Values**
- ✓ **Shorthand If, Composite Conditions, Negation Operators**

Ch 11: Python Loops

- ✓ **For Loop Concept. Iterators and Range Function**
- ✓ **Nested Loops, Conditional Loops & Exit**
- ✓ **While Loop, Break, Continue, Paas Concepts**

Ch 12: Python Functions

- ✓ **Defining Functions. Execution / Invoke Options**
- ✓ **Multi Function Arguments, Parameters**
- ✓ ***args, keyword arguments, List Arguments, Returns**

Ch 13: Python Lamda Functions

- ✓ **Inline Functions, Anonymous Functions in Python**
- ✓ **Condition Checks with lambda, filter() Function**
- ✓ **List Items, reduce() and functools**

Ch 14: Pandas Dataframes - 1

- ✓ **Python Dataframes. DataFrame() Function**
- ✓ **Dataframes from Values, Variables**
- ✓ **Slicing Dataframes, Basic Operations**
- ✓ **Indexing, Sorting, Column Filtering**

Ch 15: Pandas Dataframes - 2

- ✓ **Dataframe Concat, Merge (Join)**
- ✓ **Data Cleansing, Replace & Loops**
- ✓ **Identify & Remove Duplicates**
- ✓ **Date, Time Functions, Calendar Generation**

Ch 16: NumPy

- ✓ **NumPy Array Creation Functions**
- ✓ **1D, 2D, 3D Array Indexing and Slicing**
- ✓ **Reshaping Arrays, Statistical Functions**
- ✓ **Filter with Boolean Indexing**

Ch 17: Python SQL DB Access

- ✓ **SQL DB Access with Python**
- ✓ **pyodbc module, sql functions**
- ✓ **SQL DB Cursor Connections**
- ✓ **Filters, Aggregations with SQL**

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Ch 18: Python File Handling

- ✓ **Python File Operations. File Reads, Writes**
- ✓ **File Attributes & Write & Append Modes**
- ✓ **File Open, Close, Loops & Split**

Ch 19: Python Regular Expressions

- ✓ **Python RegEx Module**
- ✓ **Findall, search, split, sub**
- ✓ **Match Object, span, string, group options**

Real-time Project

The curriculum concludes with a real-time case study that brings together the core Python analytics skills covered throughout the course. Learners apply programming, file/data handling, dataframe operations, SQL connectivity and transformation techniques in a practical data-analysis scenario.

Suggested Project Workflow

Step	Activity	Practical Focus
1	**Understand the Data**	Review source structure, columns, data types and business context.
2	**Ingest & Prepare**	Load data from files and/or SQL sources into Python dataframes.
3	**Clean the Data**	Handle nulls, duplicates, type conversions and inconsistent values.
4	**Transform & Combine**	Use filters, joins, merge/concat and calculated transformations.

5	**Analyze**	Apply aggregations, conditions, functions and date/time logic.
6	**Validate & Present**	Cross-check results and prepare analysis-ready outputs.

Skills Demonstrated in the Project

- Python programming fundamentals and control flow
- Pandas / NumPy dataframe handling
- File handling and SQL database connectivity
- Data cleaning, null handling and duplicate management
- Data joins, merges, concatenation and transformations
- Date/time processing, reusable functions and analytical logic

Training Approach & Learner Experience

Step-by-Step Learning	Concepts progress from Python basics to practical analytics so learners can build confidence systematically.
Hands-on Practice	The curriculum is designed around coding practice rather than theory-only learning.
Real-time Orientation	Database access, transformations and the Banking / Finance case study connect learning to workplace-style tasks.
AI-Assisted Debugging	Learners are introduced to using AI assistants as a support mechanism while debugging code.
Career Relevance	The skill set supports pathways in Data Analytics, Data Engineering, Data Science and AI-oriented roles.

Recommended Practice Pattern

- Attend the concept demonstration and reproduce the code independently
- Practice each topic with small variations instead of copying the same example
- Maintain a notebook of reusable Python, Pandas and SQL patterns
- Complete mini exercises after each major topic and integrate them into the final case study
- Review errors and debugging steps to build problem-solving confidence

Build • Analyze • Transform • Grow

This curriculum is structured to help learners progress from core Python Concepts to practical data analytics workflows with Pandas, NumPy, SQL integration and a real-time case study. Consistent hands-on practice is essential for the best learning outcomes.



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Wish you all the best!