

Python with Excel for Business Automation & Reporting

Duration: 3 days/ 24 hrs

Prerequisites: Knowledge of Programming and Microsoft Excel

Day 1 – Python Fundamentals for Excel Users (4 Hours)

Module 1: Introduction to Python & Use Cases

- Why Python for Excel automation
- Python vs Excel macros
- Corporate use cases (reporting, automation, analytics)
- Python installation & environment setup
- VS Code / Jupyter Notebook overview

Module 2: Python Basics

- Python syntax & indentation
- Variables and data types
- Operators
- Input and output
- Type conversion

Lab Modules

- Lab 1: Setup Python & development environment
- Lab 2: Write basic Python programs
- Lab 3: Perform calculations similar to Excel formulas

Outcome:

Participants understand Python basics and environment setup.

Day 2 – Python Data Structures & Control Flow (4 Hours)

Module 3: Control Structures

- Conditional statements (if, elif, else)
- Loops (for, while)
- Loop control (break, continue, pass)

Module 4: Python Data Structures

- Lists and list operations
- Tuples and immutability
- Dictionaries (key-value mapping)
- Sets (unique values)

Lab Modules

- Lab 1: Process tabular data using lists & dictionaries
- Lab 2: Simulate Excel tables using Python structures

- Lab 3: Data filtering and transformation exercises

Outcome:

Ability to manipulate structured data programmatically.

Day 3 – Working with Excel Files using Python (4 Hours)

Module 5: Reading & Writing Excel Files

- Introduction to openpyxl and pandas
- Reading Excel files
- Writing data to Excel
- Working with multiple sheets
- Cell-level operations

Module 6: Excel Automation

- Updating existing Excel reports
- Creating formatted Excel outputs
- Automating repetitive Excel tasks

Lab Modules

- Lab 1: Read Excel data into Python
- Lab 2: Update Excel sheets programmatically
- Lab 3: Generate Excel reports from Python scripts

Outcome:

Hands-on experience with Excel automation using Python.

Day 4 – Data Analysis & Reporting with Excel Data (4 Hours)

Module 7: Data Analysis using Pandas

- DataFrames and Series
- Data cleaning (missing values, duplicates)
- Filtering, sorting, grouping
- Aggregations (sum, avg, min, max)

Module 8: Business Reporting Logic

- Excel-like operations using Pandas
- Pivot-style analysis
- Calculated columns

Lab Modules

- Lab 1: Clean raw Excel data
- Lab 2: Perform business analytics on Excel datasets
- Lab 3: Create summary reports using Python

Outcome:

Participants can analyze Excel data efficiently using Python.

Day 5 – Data Visualization & Automation Workflows (4 Hours)**Module 9: Data Visualization**

- Introduction to matplotlib & seaborn
- Line charts, bar charts, pie charts
- Visualizing Excel-based reports
- Exporting charts

Module 10: Automation Workflows

- Automating daily/weekly reports
- Scheduling Python scripts (conceptual)
- Integrating Python scripts with Excel workflows

Lab Modules

- Lab 1: Create visual reports from Excel data
- Lab 2: Generate charts automatically
- Lab 3: End-to-end Excel → Python → Report automation

Outcome:

Ability to create automated analytical dashboards.

Day 6 – Error Handling, Optimization & Mini Project (4 Hours)**Module 11: Error Handling & Best Practices**

- Exceptions and error handling
- Logging basics
- Code modularization
- Performance considerations

Module 12: Mini Project

- Real-world corporate Excel automation scenario
- Requirement understanding
- Script development
- Report generation
- Output validation

Lab Modules

- Lab 1: Implement error handling in Excel automation
- Lab 2: Optimize Python scripts
- Lab 3: Mini Project – Automated Excel Business Report

Outcome:

Participants deliver a complete Python-Excel automation solution.