SYLLABUS

PROGRAMMING LANGUAGES · COURSE HANDOUT 2026

PYTHON

NTAX . DATA STRUCTURES . C
FILES . APIS . TESTING . HIGH
YNC . PACKAGING . TOOLING

DURATION	LEVEL	MODULES	MODE
60 Hours	**Beginner to Advanced**	**8**	**Classroom · Online · Hybrid**

01 COURSE OVERVIEW

A complete Python course from syntax to packaged, tested applications. The course covers the language properly — data model, iteration, functions, classes, typing, errors — then the standard library and the practices that make Python maintainable: virtual environments, testing, linting and packaging.

Learners build a CLI tool, an API client and a small automated service.

WHO IT IS FOR

- Beginners to programming
- Analysts automating work
- Developers adding Python
- Students in engineering and science

PREREQUISITES

None.

02 LEARNING OUTCOMES

01 Write clear Python using appropriate data structures.

02 Structure code into modules and packages.

03 Use classes, dataclasses and type hints.

04 Handle files, JSON, CSV and HTTP APIs.

05 Write tests with pytest and measure coverage.

06 Use virtual environments and manage dependencies.

07 Write async code where it helps.

08 Package and distribute a tool.

03 MODULE STRUCTURE

8 MODULES

01 LANGUAGE BASICS

Numbers and strings

Lists, tuples, sets, dicts

Control flow

Functions

Scope

Comprehensions

LAB

EXERCISES SET

02 FUNCTIONS AND ITERATION

Arguments and defaults

*args and **kwargs

Closures

Generators

Iterators

itertools

functools

03 OBJECT-ORIENTED PYTHON

- Classes
- Inheritance and composition
- Dunder methods
- Properties
- Dataclasses
- Enums
- ABCs

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DOMAIN MODEL

04 ERRORS AND TYPING

- Exceptions
- Custom exceptions
- Context managers
- Type hints
- Optional and Union
- mypy basics

05 STANDARD LIBRARY

- pathlib
- datetime
- json and csv
- re
- collections
- logging
- argparse
- subprocess

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CLI TOOL

06 WORKING WITH DATA AND APIS

- requests
- Pagination and retries
- Rate limits
- Auth headers
- Pandas introduction
- SQLite

LAB

API CLIENT

07 TESTING AND QUALITY

- pytest
- Parametrisation
- Coverage
- Pre-commit hooks
- Fixtures
- Mocking
- ruff and black

08 ASYNC AND PACKAGING

- asyncio basics
- httpx
- pyproject.toml
- Publishing
- Tasks and gathering
- Project layout
- Virtual environments

PROJECT

PACKAGED PYTHON TOOL

04 ASSESSMENT & CERTIFICATION

Module assignments and labs	**25%**
Mini projects	**20%**
Internal assessments	**15%**
Final project and review	**40%**

CERTIFICATION

Learners who complete all modules, submit the final project and clear the review receive a course completion certificate from Kaizen Infinities Private Limited. Project work is documented for the learner's portfolio, and interview preparation is included in the closing sessions.

05 CAREER OUTCOMES

ROLES THIS PROGRAMME PREPARES FOR

PYTHON DEVELOPER **AUTOMATION ENGINEER** **BACKEND DEVELOPER** **DATA ENGINEER** **DEVOPS ENGINEER**

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