

## Advanced Python (code: PYTHON-ADV)

### Overview

This training focuses on teaching the **advanced possibilities** of the Python language. During the course we will venture far beyond writing simple scripts and we will study the secrets of *profiling*, *concurrent programming* and *metaclasses* usage.

We will discuss *efficiency*, both memory and computational, we will take a look at some less known but very powerful Python libraries. Completing our **Advanced Python** course will give you solid foundations to implement real *business applications* using Python language. All classes include **many practical examples** and exercises, to illustrate the discussed issues.

All our trainers are both experienced teachers and experienced Python developers.

### Ask for details

Phone +44 203 608 6289

info@alx.training

### Duration

3 days

### Agenda

1. Iterators and context managers
  - Introduction to iterators
  - Passing data to iterators
  - Practical examples
    - Memory efficiency
    - the `_itertools_` module
    - modularizing the code
  - Iteration protocol
    - Implementing your own iterator
    - Context managers and `_contextlib_`
2. Encodings, serialization, binary data
  - Unicode and encoding methods
  - Correctly managing binary and text data
  - Other text codecs
  - Reading binary structures
  - Serializing Python objects with `_pickle_`
    - Pickle's safety
    - Serializing your own data types
3. Types, classes, metaclasses
  - Defining types in runtime
  - Introspection of objects and classes
  - When to use metaclasses
  - Examples
4. Testing
  - How to write correct tests
  - Libraries used for testing
    - `standard _unittest_`
    - `_nose_` and `_tox_`
  - Checking code coverage
    - `coverage.py`
    - Line coverage vs branch coverage
5. Advanced tools
  - The IPython interpreter

- Virtual environments and virtualenv
- Python's built-in debugger - pdb
- Debugging Python from gdb
- 6. Profiling
  - Types of profilers in Python
    - Built-in profiler
    - Statistical profiling
  - Interpreting Python profiles
  - Optimizing Python code
  - Decompiling, reading opcode, the `_dis_` module
  - Memory profilers
    - `_objgraph_`
    - `_dowser_`
    - `_heapy_`
- 7. Concurrency
  - Introduction to GIL
  - Common problems with parallel execution
    - Locks
    - Mutexes and semaphores
    - Conditions
  - Libraries for concurrent programming
    - using threads, the `_threading_` module
    - using processes, the `_multiprocessing_` module
  - Using concurrency to make programs faster

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During our courses we use the latest Python version (branch 2). In case of on-demand courses, it's possible to use any version required by the Client, according to his needs.

## Target audience and prerequisites

Basic knowledge of the Python language.

## Certificates

Course participants receive completion certificates signed by ALX.

## Locations

- Warsaw (English) – Jasna 14/16A
- Online (English) – your home, office or wherever you want
- any other location (London, UK, EU) on request

## Price

990 EUR

The price includes:

- course materials,
- snacks, coffee, tea and soft drinks,
- course completion certificate,
- one-time consultation with the instructor after course completion.