

Programming: Python

Materials & teaching in English



Learn Python from the ground up and build the skills to work with data structures, algorithms and real-world applications.

Python is one of the most widely used programming languages in the world. It is the language behind data analysis, machine learning, web development and automation, and it is consistently one of the most requested skills in tech job postings. If you want to work professionally with code, Python is one of the most practical and versatile places to start.

The course takes you through Python from the beginning. You start with the fundamentals of programming: how to think logically, structure code and work with the basic building blocks of any language. From there you move into Python itself, covering control flow, functions, lists, strings, dictionaries and classes with hands-on labs throughout.

The intermediate part of the course goes deeper. You work with decorators, object-oriented programming, exceptions and unit testing. You also explore iterators, generators and context managers, the patterns that show up constantly in professional Python development.

The course then moves into algorithms and sorting. You learn how to

measure the efficiency of your code, implement recursion, merge sort and quicksort, and understand how algorithmic complexity matters in practice.

Data structures follow: linked lists, queues, stacks, trees and graphs, all implemented in Python. These are the structures that underpin how software organises and processes information efficiently.

The final part covers advanced Python: functional programming, working with SQLite databases, concurrent programming with asyncio, threading and multiprocessing, and deploying a script with Flask. This is where everything comes together in tools and patterns used in real software projects.

Each section concludes with an assessment. The course concludes with an exam. Included is 1 certification attempt for the Python Coding Apprentice (PCA) certification - a documented proof of your skills that carries weight in a job application.

You will learn



Programming Fundamentals

- Understand how programming works and think like a developer
- Learn control flow, loops, functions and data structures
- Build a solid foundation before writing Python code



Python Core

- Work with strings, lists, tuples, dictionaries and files
- Use list comprehension, modules and string methods
- Build and organise code with classes and OOP principles



Intermediate Python

- Work with decorators, lambda and higher-order functions
- Handle exceptions and write unit tests for your code
- Use iterators, generators, context managers and collections



Algorithms and Sorting

- Learn time and space complexity with asymptotic notation
- Implement recursion, merge sort and quicksort in Python
- Analyse how algorithmic efficiency affects applications



Data Structures in Python

- Implement linked lists, queues, stacks, trees and graphs
- Work with binary search and graph search algorithms
- Understand how data structures affect performance at scale



Advanced Python

- Work with SQLite databases and functional programming
- Use asyncio, threading and multiprocessing in Python
- Deploy a Python application with Flask

The course is for you if you...

- ✓ You want to work as a developer and are ready to learn Python properly, from core syntax and object-oriented programming through to data structures, algorithms and advanced application development.
- ✓ You have some interest in or exposure to programming and want a structured, comprehensive path through Python that ends with skills and a certificate you can show to employers.

Course structure

The course includes self-paced online sessions, Labs and a Final Exam assessment. You also get access to a library of e-books.

Certification

The course concludes with an exam. Included is 1 certification attempt for the Python Coding Apprentice (PCA) certification. The attempt must be used within 1 month of completing the course.

Careercoach

You also can spar with Itucation's career coach regarding CV, application and job strategy. If you wish to take advantage of this offer, please send an email to kurser@itucation.dk



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Itucation
 Svanevej 22, 2400 København NV
kurser@itucation.dk (sikker mail)
 CVR-nr.: 33248016
 P-nr.: 1016378247