

KOENIG SOLUTIONS • COURSE OUTLINE

Python Programming

Learn to write Python programs, from syntax, functions and data structures to object-oriented code, file handling, data processing and GUI development.

5 Days

40 HOURS

16

MODULES

140

TOPICS

COURSE OVERVIEW

The Python Programming course is a comprehensive python bootcamp course designed to introduce learners to the versatile world of Python, one of the most popular and in-demand programming languages today. This course covers everything from the basics of Python syntax and programming concepts to advanced topics like Object-oriented programming and GUI development. Starting with Module 1, learners will get acquainted with Python, how to install it across different operating systems, and explore Python IDLE for interactive and scripting modes of programming. As they progress, they will delve into Types, Variables, Flow control with if/else/elif statements, Loops, and data structures such as tuples, lists, and dictionaries. The course also covers Functions, File operations, Exception handling, and the principles of Object-oriented programming, which are essential for writing robust and maintainable code. Further, the course provides a deep dive into writing and using Modules, underscored by the importance of structuring code for reusability and maintainability. By the end of the bootcamp python course, learners will be equipped to develop graphical applications using Tkinter, emphasizing Event-driven programming to create interactive user interfaces. Structured to cater to both beginners and those looking to sharpen their programming skills, this Python bootcamp course is an excellent stepping stone towards becoming a proficient Python developer.

Who Should Attend

Koenig Solutions' Python Programming course offers foundational to advanced skills for aspiring developers and IT professionals.
Target Audience and Job Roles:

Beginner software developers seeking to learn Python

Data analysts who want to leverage Python for data manipulation and analysis

IT professionals looking to automate tasks or develop scripts with Python

Students and academic researchers requiring Python for scientific computing

Quality assurance engineers interested in writing test scripts

System administrators for scripting and automation

Technical professionals transitioning into programming roles

Web developers who intend to use Python for backend development

Hobbyists and DIY enthusiasts looking to apply Python in hardware projects (e.g., Raspberry Pi)

Professionals in data-intensive fields (finance, biology, etc.) looking for a powerful scripting language

Educators and trainers teaching programming concepts

Entrepreneurs and business owners needing to understand the technical aspects of their products or services

LEARNING OBJECTIVES

- Apply core Python syntax, data types and data structures
- Define functions, lambdas and decorators for reusable code
- Implement iterables, loops, comprehensions and generators
- Manipulate strings, dates, times and mathematical operations
- Handle files, exceptions and custom error conditions
- Build classes and objects using object-oriented principles
- Process JSON, XML and CSV data with Python libraries
- Develop GUI applications with Tkinter

16 Modules, 140 Topics

01

Introduction to Python

TOPICS

- Introduction to Python
- Overview Python Based Applications
- Environment Setup
- Data Types
- Variables and its Scope
- Data Structure
- Operations on Data Structure
- Input and Output Operation
- Writing a Python Module

02

Functions

TOPICS

- Define and use custom functions within a Python program
- Types of function
- Types of Arguments
- Map Function
- Filter Function
- Reduce Function
- Naming conventions
- Using Imports
- Documentation
- Executing Modules as Scripts
- Extended Keyword Arguments (*args, **kwargs)
- Lambda Functions
- Decorators

03

Iterables and Conditional Statement

TOPICS

- Definitions
- Sequences
- Unpacking Sequences
- Dictionaries
- The len() function Sets
- Conditional Statements
- Loops in Python
- break and continue
- The enumerate() Function
- Generators
- List Comprehensions
- Advanced List Comprehensions
- Collections Module
- Mapping and Filtering
- Mutable and Immutable Builtin Objects
- Sorting
- Unpacking Sequences in Function Calls

04

Modules

TOPICS

What are modules · General Format · Importing Modules · Executing functions from other modules · The `__name__` variable

05

Python Strings

TOPICS

- Quotation Marks and Special Characters
- String Indexing
- Slicing Strings
- Concatenation and Repetition
- Common String Methods
- String Formatting
- Namespaces
- Formatted String Literals (f-strings and `.format()` method)
- Built-in String Functions

06

Python Dates and Times

TOPICS

Understanding Time · The Time Module · The datetime Module

07

Math

TOPICS

Arithmetic Operators · Assignment Operators · Built-in Math Functions · The math Module · The random Module

08

File Processing

TOPICS

Opening Files · The `os` and `os.path` modules · Reading files · Writing into a file · Appending data into a file

09

Exception Handling

TOPICS

Except Clauses · The `else` clause · The `finally` clause · Using Exceptions For Flow Control · Raising your own exceptions · Exception Hierarchy

10

OOPS in Python

TOPICS

- Introduction to Object-Oriented Python
- Creating Classes, Methods, and Objects
- Using Constructor and Attributes
- Using Class Attributes and Static Methods
- Understanding Object Encapsulation
- Private Attributes and Methods
- Controlling Attribute Access
- Creating and Accessing Properties

11

Playing with Data

TOPICS

- Relational Databases
- CSV
- Getting Data from the Web
- JSON
- Overview of Data Serialization
- Importance of Data Interchange Formats
- Understanding JSON syntax and structure
- Encoding Python Data to JSON - Serialization
- Decoding JSON to Python Data - Deserialization
- Introduction to XML
- Parsing XML with xml.etree.ElementTree
- Best Practices in XML Processing
- Introduction to CSV Format
- Reading CSV data
- Writing Data into CSV files
- Best Practices for CSV Processing
- Integrating JSON, XML and CSV using advanced python library Pandas

12

NumPy

TOPICS

- Introduction to NumPy
- Installation
- NumPy Arrays (numpy.array)
- Array Indexing and Slicing
- Array Shape and Reshaping
- Array Operations (Sum, Mean, etc.)
- numpy.arange and numpy.linspace
- Array Stacking and Splitting
- Data Type Promotion
- Formation of 1D, 2D and 3D arrays
- Exploring dimension type, shape and size of array
- Exploring dimension type, shape and size of array
- Indexing of NumPy Arrays
- Slicing of NumPy Arrays
- One's Matrix and Zero's Matrix
- Identity Matrix
- min() and argmin()
- max() and argmax()
- np.sort()
- np.argsort()
- Addition of matrices
- Multiplication of matrices

13

Pandas

TOPICS

- Introduction to Pandas
- Series
- DataFrames
- Missing Data
- Merging Joining and Concatenating
- Operations
- Data Input and Output
- Groupby()
- Pivoting
- VLookup

14

Tkinter

TOPICS

Introduction to GUI Development · Introduction to Tkinter · First Step to creating Tkinter Applications · Geometry Manager · Grid Layout · Develop an app based on Tkinter · Project exercise on Tkinter

15

Project

TOPICS

- Use Python to develop a bill generator for a shopping mall
- Pizza Ordering Kiosk using Tkinter

16

Testing and Debugging

TOPICS

Testing for Performance · The unittest Module

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

Visit koenig-solutions.com

✉ info@koenig-solutions.com