

KOENIG SOLUTIONS · COURSE OUTLINE

Certified Entry-Level Python Programmer (PCEP)

Learn to write Python programs using variables, control flow, data structures, functions, exceptions, and modules.

2 Days

DURATION

9

MODULES

43

TOPICS

17

HANDS-ON LABS

COURSE OVERVIEW

This course covers Python basics including setup, syntax, variables, data types, and operators, followed by input/output operations and string handling. It then addresses control flow structures such as conditionals and loops, along with core data structures including lists, tuples, dictionaries, and sets. The course proceeds to functions, exception handling, and the use of standard and custom modules and packages. It concludes with a capstone lab that applies these concepts in a student grade management system.

WHO THIS COURSE IS FOR

Aspiring Python Developers

Software Developers

QA Engineers

Data Analysts

Students And Beginners

PREREQUISITES

- Knowledge of any programming language

LEARNING OBJECTIVES

- Describe Python's execution model, syntax, and indentation rules
- Apply variables, data types, and operators in expressions
- Handle input and output using print, f-strings, and input()
- Apply string indexing, slicing, and common string methods
- Implement control flow using conditionals and loops
- Organise data using lists, tuples, dictionaries, and sets
- Define functions with parameters, return values, and recursion
- Handle exceptions using try, except, else, and finally

CERTIFICATION

Aligned Certification:

PCEP-30-02 (Optional)

9 Modules, 43 Topics

DAY 1

Python Basics, Flow Control, and Data Structures

01

Lab

Python Overview & Setup

TOPICS

- Introduction to Python (history, features, applications)
- Python Execution Model (script vs interactive mode, Jupyter Notebook)
- Python syntax & indentation rules
- Comments (single-line, multi-line, docstrings)

02

2 Labs

Variables, Data Types, and Operators

TOPICS

- Variables & assignment rules
- **Primitive data types:** int, float, bool, str
- Type conversion (explicit vs implicit)
- Arithmetic, comparison, logical, bitwise operators
- Operator precedence & associativity
- Boolean expressions & truth tables

03

2 Labs

Input/Output and String Handling

TOPICS

- Input with input()
- Formatted output (print, f-strings, .format())
- String indexing, slicing, immutability
- **Common string methods:** upper(), lower(), strip(), split(), replace(), find()

04**3 Labs**

Control Flow Structures

TOPICS

- if, elif, else
- Nested conditions
- **Loops:** for, while
- **Loop control statements:** break, continue, pass
- range() function in loops

05**3 Labs**

Data Structures - Lists, Tuples, Dictionaries, and Sets

TOPICS

- **Lists:** creation, indexing, CRUD operations, slicing, built-in methods (append, extend, sort)
- **Tuples:** immutability, use cases
- **Dictionaries:** key-value pairs, CRUD operations, methods (keys, values, items)
- **Sets:** uniqueness, set operations (union, intersection, difference)

DAY 2

Functions, Exceptions, Modules, and Certification Prep

06**2 Labs**

Functions in Python

TOPICS

- Defining and calling functions
- **Parameters:** positional, keyword, default arguments
- Return values
- **Variable scope:** local vs global
- Recursion basics

07**2 Labs**

Exception Handling

TOPICS

- Errors vs exceptions
- Built-in exceptions (ZeroDivisionError, ValueError, etc.)
- try, except, else, finally blocks
- Raising exceptions with raise

Modules & Packages

TOPICS

- Importing standard modules (math, random, datetime, os, sys)
- Using dir() and help()
- Writing custom modules
- Concept of packages & __init__.py
- Installing external packages with pip

Capstone Lab (End-to-End Mini Project)

STUDENT GRADE MANAGEMENT SYSTEM

- Input student names and marks
- Store them in a dictionary
- Compute average, highest, and lowest marks
- Assign grades (A/B/C) using if-else
- Handle invalid inputs using exception handling
- Export results as a formatted string

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
01	Python Overview & Setup	Setup environment, write & run first Python program (Hello PCEP!)
02	Variables, Data Types, and Operators	■ Create a BMI calculator ■ Practice operator precedence with expressions
03	Input/Output and String Handling	■ Program to check palindrome strings ■ Extract domain from an email string
04	Control Flow Structures	■ Program to print multiplication table ■ Fibonacci sequence using while loop ■ Number guessing game
05	Data Structures - Lists, Tuples, Dictionaries, and Sets	■ Store student marks in a dictionary & compute average ■ Use sets to find unique items in a list ■ Sort list of employees by salary
06	Functions in Python	■ Write factorial function using recursion ■ Create function to calculate compound interest
07	Exception Handling	■ Program to handle division by zero gracefully ■ Custom input validation with exceptions

#	MODULE	ACTIVITY
08	Modules & Packages	■ Dice roll simulator with random ■ Create custom math utility module and import it

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.

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