

Certified Entry Level Python Programming (PCEP)

Duration 2 days

Prerequisite: Knowledge of any programming language

Aligned Certification: PCEP-30-02 (Optional)

Day 1 – Python Basics, Flow Control, and Data Structures

Module 1: Python Overview & Setup

- 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)

Lab: Setup environment, write & run first Python program (Hello PCEP!)

Module 2: Variables, Data Types, and Operators

- 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

Lab:

- Create a BMI calculator
 - Practice operator precedence with expressions
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Module 3: Input/Output and String Handling

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

Lab:

- Program to check palindrome strings
 - Extract domain from an email string
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Module 4: Control Flow Structures

- if, elif, else

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

Lab:

- Program to print multiplication table
 - Fibonacci sequence using while loop
 - Number guessing game
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Module 5: Data Structures – Lists, Tuples, Dictionaries, and Sets

- 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)

Lab:

- Store student marks in a dictionary & compute average
 - Use sets to find unique items in a list
 - Sort list of employees by salary
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Day 2 – Functions, Exceptions, Modules, and Certification Prep

Module 6: Functions in Python

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

Lab:

- Write factorial function using recursion
 - Create function to calculate compound interest
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Module 7: Exception Handling

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

Lab:

- Program to handle division by zero gracefully
 - Custom input validation with exceptions
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Module 8: Modules & Packages

- 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

Lab:

- Dice roll simulator with random
 - Create custom math utility module and import it
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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