

Python Level 1 – Introduction

Information Technology Specialist

Courseware: **8510-1**

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Course Description

This course introduces learners to the Python language and is mapped to Certiport's certification exam objectives, a globally accepted, standard-based credential for validating skills.

Learners will begin with a basic introduction to some fundamental programming concepts and the python language, followed by different data structures and operations used in Python.

Control flow using branching and loops are discussed along with an introduction to input and output operations from files and the console. Finally, the topic of modules and packages will be covered. Learners will discover how to code using Python and solve different problems.

Successful completion of the certification exam validates the knowledge and skill sets of individuals seeking employment or advancement in their careers.

Suggested Course Length: 40-70 Hours

Course Prerequisites

This course contains interactive coding exercises. If you would like to utilize the practice exercises you will need to use a Python Compiler. There are various compilers to choose from depending on your device and internet connection.

Unit 1: Python Data Types Operation

Unit Objectives

Lesson 1: Introduction

Lesson Objectives
 Programming Languages
 Interpreters vs Compilers
 Work with Python
 Python Structure
 Python Syntax and Semantics
 Python Keywords
 Inline and Multi-Line
 Comments
 The Main Use Cases of Python
 The Different Versions of Python
 The Core Features of the Python Language
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 2: Python Primitive Data Structures

Lesson Objectives
 Introduction
 Variables
 Strings
 Numbers
 Booleans
 Lesson Summary
 Practice Exercise
 Practice Questions
 Unit Summary
 Key Terms
 Unit Create Project 1
 Unit Create Project 2
 Unit Create Project 3
 Unit Objective Assessment

Unit 2: Python Non-Primitive Data Structures

Unit Objectives

Lesson 1: Objects and Data Structures

Lesson Objectives
 Combine Different Data Types
 Python Built-In Objects - Strings, Numbers, and Booleans
 Variables Mutability
 Structured Built-In Objects
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 2: Lists

Lesson Objectives
 Define Lists
 Add Items to Lists
 Remove Items from Lists
 List Methods
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 3: List Manipulation Techniques

Lesson Objectives
 List Concatenation
 Nested Lists
 Enumerate() Method in Python
 The copy() Method
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 4: Strings as Lists

Lesson Objectives
 Strings
 Slicing
 Deletion
 Concatenation
 Iteration
 Membership Check
 String Methods
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 5: Tuples

Lesson Objectives
 Define and Enumerate
 Tuples
 Tuple Elements
 Change Tuples
 Concatenate Tuples
 Pack and Unpack a Tuple
 Tuple Methods
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 6: Sets

Lesson Objectives
 Define Sets
 Add Elements to a Set
 Use Set Elements
 Remove Elements from a Set
 Iterate Over a Set Using Enumerated *for* Loop
 Nest Sets
 Set Methods
 Lesson Summary
 Practice Exercise
 Practice Questions

Lesson 7: Literals

Lesson Objectives
 Literals
 Numeric Literals
 String Literals
 None, the Special Literal
 Boolean Literals
 Literal Collections
 Lesson Summary
 Practice Exercise
 Practice Questions
 Unit Summary
 Key Terms
 Unit Create Project
 Unit Objective Assessment

Unit 3: Python Data Types Operation

Unit Objectives

Lesson 1: Data Types Operations

- Lesson Objectives
- Type Casting and Type Conversion
- Index Strings in Python
- Slice Strings in Python
- Define Structures by Comprehension
- Data Structures that Adapt to a Problem
- Optimized Data Structures for Different Problems
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Exercise 4
- Practice Exercise 5
- Practice Exercise 6
- Practice Questions

Lesson 2: Operators in Expressions

- Lesson Objectives
- Operators and Operands
- Arithmetic Operators
- Comparison Operators
- Assignment Operators
- Lesson Summary
- Practice Exercise
- Practice Questions

Lesson 3: Advanced Operators in Expressions

- Lesson Objectives
- Logical Operators
- Bitwise Operators
- Identity Operators
- Membership and Containment Operators
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Questions

Lesson 4: Order of Operations

- Lesson Objectives
- Operators Precedence
- Operators Associativity
- Operators Precedence Short-Circuiting
- any() / all() Short-Circuiting
- Comparison Operators Short-Circuiting
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Questions

Lesson 5: Sort Data

- Lesson Objectives
- Sort Integers
- Sort Strings
- Argument: 'key'
- .sort()
- sorted() vs .sort()
- Lesson Summary
- Practice Exercise
- Practice Questions
- Unit Summary
- Key Terms
- Unit Create Project
- Unit Objective Assessment

Unit 4: Python Flow Control

- Unit Objectives

Lesson 1: Branching Statements

- Lesson Objectives
- Logical Operators and Their Precedence
- NOT Operator
- AND Operator
- OR Operator
- Multiple Logical Operators
- If Statements
- Nested If Statements
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Exercise 4
- Practice Questions

Lesson 2: Iteration Statements

- Lesson Objectives
- For Loops
- For Loops Logic
- Iterable Objects
- Use Range
- Iterate Dictionary
- Iterate Key-Value
- List Comprehensions
- Order Items
- While Loops
- Control Loops
- Nested Loops
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Exercise 4
- Practice Exercise 5
- Practice Exercise 6
- Practice Questions

Lesson 3: Graphs

- Lesson Objectives
- Connected vs. Disconnected Graphs
- Directional vs. Non-Directional Links
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Questions
- Unit Summary
- Key Terms
- Unit Create Project
- Unit Objective Assessment

Unit 5: Python Input and Output Operations

- Unit Objectives

Lesson 1: File Input and Output

- Lesson Objectives
- Handle a File
- Open a File
- Read a File
- Create and Write to a File
- Append to a File
- Handle Binary Files

- Delete a File
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Exercise 4
- Practice Questions

Lesson 2: Console Input and Output

- Lesson Objectives
- Input Data from Console
- Typecast Input Data
- Check Input Errors
- Print Data to Console
- Print Formatted Text
- Run Python Code on Console
- Lesson Summary
- Practice Exercise 1
- Practice Exercise 2
- Practice Exercise 3
- Practice Questions
- Unit Summary
- Key Terms
- Unit Create Project
- Unit Objective Assessment

Unit 6: Python Modules and Packages

- Unit Objectives

Lesson 1: Introduction to Python Modules

- Lesson Objectives
- Python Modules
- Random Module
- OS Module
- Create User-Defined Modules
- Use User-Defined Modules
- Lesson Summary
- Practice Exercise
- Practice Questions

Lesson 2: Introduction to Python Packages

- Lesson Objectives
- Python Packages
- Standard Python Library
- Additional Python Packages
- Create External Python Packages

- Use External Python Packages
- Lesson Summary
- Practice Exercise
- Practice Questions

Lesson 3: Introduction to Events and Hooks

- Lesson Objectives
- Events and Hooks
- Events Library
- Lesson Summary
- Practice Exercise
- Practice Questions

Lesson 4: Introduction to Command-Line Arguments

- Lesson Objectives
- Command-Line Arguments
- sys Module for Argument Parsing
- getopt Module for Argument Parsing
- Python Hashbangs
- Lesson Summary
- Practice Exercise
- Practice Questions
- Unit Summary
- Key Terms
- Unit Create Project
- Unit Objective Assessment

Appendices

- Courseware Mapping
- Glossary of Terms
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