CSARC

COMPUTER SCIENCE &
ROBOTICS CERTIFICATION

Certification in Python for Learners Examination Syllabus

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Introduction

The **Certification in Python for Learners** aims to provide a standardised skill benchmark for the Python 3 programming language. The certification focus is on testing candidates on core skills in programming, algorithm design, and problem solving.

Assessment Objectives Overview

1. Practical Programming

Candidates should be able to solve a objective-based problem involving:

1.1 Python Built-in Functions
1.2 Variables and Mathematics
1.3 Data Types
1.4 Programming Logic (Sequencing, Selection, Iteration)
1.5 Manipulation of Ordered Sequences
1.6 User-defined Functions
1.7 Utilising Built-in and Third-party Modules
1.8 File Operations
1.9 Graphical User Interface
1.10 Object-Oriented Programming

Scheme of Assessment

1. Certificate Tiers

1.1 Each grade examination has a maximum possible score of 25.

1.2 Candidates will be issued a certificate if they meet the passing score requirement.

1.3 Certificates have different tier levels based on the score requirements as set out in **Table 1**: Certificate Tier Levels

Table 1: Certificate Tier Levels

Score Requirement	Certificate Tier
≥ 13	Pass
≥ 16	Merit
≥ 20	Distinction
≥ 23	High Distinction

2. Examination Format

2.1 Each grade examination will wholly consist of programming questions across a range of topics as set out in the syllabus.

2.2 No reference to other material such as online/offline resources and tools will be allowed during the examination.

Certificate Examination Syllabus by Grade

Grade 1

Programming Concepts	
1.1	**Executing programming operations in sequence** • Print statements • Mathematical operators (addition, subtraction, multiplication, division, exponentiation, floor division, modulo) **Initialising and modifying variables** • Variable name rules
1.2	**Data Types** • Understand differences in data types (integer, float, string, boolean, list) • Understand how operators behave differently on different data types • Data type conversion
1.3	**User Input** • Prompt user to input information • Perform data type conversion on user input
1.4	**Selection** • Understand how to use If, Elif, Else statements **Comparison Operators** • Usage of greater than, less than, and equality operators **Logical Operators** • Usage of AND, OR, NOT operators
1.5	**Repetition (While Loop & For Loop)** • Usage of loops to iterate and increment counter variables • Usage of break to terminate while loop
1.6	**String Operations** • Referencing elements of string by index • Iterating through elements of string • String slicing via index
1.7	**List Operations** • Referencing elements of string by index • Iterating through elements of string • List operations: extend(), append(), pop(), remove(), len(), sort(), join()

Grade 2

Programming Concepts	
1.1	**Nested List** • Accessing nested list elements by index • Iterating through nested list elements using for loop
1.2	**Formatted String Literals** • Usage of f-strings to print out variables • Usage of formatting flags to format variables for print
1.3	**Functional Programming** • Writing user defined functions with input arguments • Usage of function return
1.4	**File Operation** • Creating and writing to text files • Appending data to pre-existing text files • Reading text files **String Operations** • Usage of strip() and split()

Grade 3

Programming Concepts	
1.1	**Graphical User Interface using Tkinter** • Creating simple GUI elements: text label, button, radio button, entry box • Font formatting, size formatting • Pack/Place elements on application • Generating message box • Writing event functions
1.2	**Object Oriented Programming** • Defining classes, class attributes, class methods • Creating objects from classes • Class inheritance • Operator overloading