Academic Council

Item No: _____

Devrukh Shikshan Prasarak Mandal's

Nya. TATYASAHEB ATHALYE ARTS, Ved. S.R. SAPRE COMMERCE & Vid. DADASAHEB PITRE SCIENCE COLLEGE, DEVRUKH [AUTONOMOUS]

Course: Certificate Course in Python Programming- I

Academic Year 2022-23

Certificate Course
Python Programming I
Theory

Theory	**Python Programing**		**No of Credits**	**Lectures/Week**
	I	Basics of Python, Functions & Conditional statements	**2**	**4**
	II	Iterations, Strings, Lists, Tuples, Dictionary in Python		
Practical	Python Programming Exercises		**1**	**4**

Objectives:

The objective of this paper is to introduce the students various concepts of programming and students can using Python as the programming language.

Expected learning outcomes

1. Develop a basic understanding of programming and the Python programming Language.
2. Students will use their problem solving abilities to implement programs in Python.
3. Familiarization about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
4. Introduction to advanced topics in Python such as Exception Handling, Multithreaded programming, Graphical user interface & Database connectivity.

Unit- I: Basics of Python, Functions & Conditional statements (15L)

1. **Introduction:** What is a Program**,** The Python Programming Language, History, features, Installing Python, Running a Python program, the first program, Arithmetic operators, Values and types, Formal and Natural Languages.

2. **Variables , Expressions and Statements :** Assignment statements **,** Variable Names and Keywords, Expressions and statements , Script mode , Order of Operations , String operations , Comments , Debugging : Syntax Errors, Runtime
3. **Functions:** Function basics**,** Function Calls, Math Functions, Composition, Adding New Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Local variables and parameters and void Functions , return values , composition ,Boolean functions

4. **Conditionals and recursion :** Floor division and modulus, Boolean expression, Logical operators, Conditional expression, chained conditionals, Nested conditionals, Recursion , Stack diagrams for recursive functions, infinite recursion , keyboard input. Programs on recursion.

Unit-II: Iterations, Strings, Lists, Tuples, Dictionary in Python (15L)

1. **Iterations :** Reassignment , updating variables , while statement, break statement

2. **Strings:** A String is a Sequence, len built in function , for Loop traversal , String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The **in** Operator, String Comparisons.

3. **Lists:** A list is a sequence, Lists are mutable, Traversing a List, List operations , List slices, List methods , Deleting elements , Lists & Strings , Objects & Values, Aliasing , List arguments.

4. **Tuples:** Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in Tuple Functions

5. **Dictionaries:** Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-In Dictionary Functions, Built-in Dictionary Methods, in operator.

Python Programming Exercises

B1: Perform minimum two experiment

1 Write a program to generate the Fibonacci series.
2 Write a program to generate if a three digit number entered is an Armstrong number or not
3 Write a function that reverses the user defined value.
4 Write a recursive function to print the factorial for a given number.

B2: Perform minimum one experiment

1. Write a function that takes a character (i.e. a string of length 1) and returns
True if it is a vowel, False otherwise.
2. Define a function that computes the length of a given list or string.

B3: Perform minimum two experiments

1. Write a program that takes two lists and returns true if they have at least one commonmember.
2. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements. 3. Write a Python program to clone or copy a list
1. Write a Python script to sort (ascending and descending) a dictionary by value.
2. Write a Python script to concatenate following dictionaries to create a new one.
3. Write a Python program to sum all the items in a dictionary.

Reference Books

1. Official Python Web site : https://www.python.org/

2. AD : Think Python by Allen Downey , 2nd Edition

3. Paul Gries, et al., Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 2/E 2014

4. Burkhard Meier : Python GUI Programming Cookbook , Packt Publishing

5. Michael H. Goldwasser, David Letscher ,Object-oriented Programming in Python , Michael H. Goldwasser

In addition to the reference books internet web-sites & MOOC can be used wherever necessary.