

Add on Course of Python Programming

T.Y.B.Sc 2021-22

SEMESTER V

COURSE CODE: USACCS501

Unit- I: Basics of Python , Functions & Conditional statements:

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

AD: Think Python , 2nd Edition : Chapter 1.

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

AD: Think Python , 2nd Edition : Chapter 2.

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

AD: Think Python , 2nd Edition : Chapter 3

AD: Think Python , 2nd Edition : Chapter 6 : Art : 6.1 , 6.2 , 6.3 and 6.4

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

AD: Think Python , 2nd Edition : Chapter 5

Unit-II: Iterations , Strings, Lists, Tuples, Dictionary in Python

AD : Think Python , 2nd Edition : Chapter 6 : Art : 6.5 ,6,6 ,6,7 & 6.8

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

AD: Think Python , 2nd Edition : Chapter 7 up to 7.4

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.

AD: Think Python , 2nd Edition : Chapter 8

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.

AD: Think Python , 2nd Edition : Chapter 10

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.

Unit III : File & Exception Handling and OOP ,Modules in Python

- 1. Files:** Text Files, The File Object Attributes, Directories
- 2. Exceptions:** Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.
- 3. Object Oriented Programming , Modules in Python**
Classes and Objects: Overview of OOP (Object Oriented Programming), Class Definition, Creating Objects, Instances as Arguments, Instances as return values, Built-in Class Attributes, Inheritance, Method Overriding, Data Encapsulation, Data Hiding
- 4. Modules:** Importing module, Creating and exploring modules, Math module, Random module, Time module

References: For units I and II:-

- 1. Official Python Web site : <https://www.python.org/>**
- 2. AD : Think Python by Allen Downey , 2nd Edition**

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 common member.
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

Python Program :

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.
4. Write a Python program to read an entire text file.
5. Write a Python program to append text to a file and display the text.
6. Write a Python program to read last n lines of a file.
7. Design a class that store the information of student and display the same
8. Implement the concept of inheritance using python
9. Write a program to implement exception handling.