

Python Programming

Course Code	20SO8455	Year	II	Semester	II
Course Category	SOC	Branch	IT	Course Type	Theory/Practical
Credits	2	L-T-P	1-0-2	Prerequisites	Fundamentals of Computers
Continuous Internal Evaluation	-	Semester End Evaluation	50	Total Marks	50

Course Outcomes		Blooms Taxonomy Level
Upon Successful completion of course, the student will be able to		
CO1	Understand the basic concepts of Python Programming.	L2
CO2	Apply functions, modules and string handling in Python to solve problems.	L3
CO3	Analyze and choose appropriate data structure for solving problems.	L3
CO4	Analyze data using computation and visualization libraries.	L3

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (H: High, M: Medium, L: Low)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3		3				3	3			3	3
CO2	3	3	3		3				3	3			3	3
CO3	3	3	3		3				3	3			3	3
CO4	3	3	3		3				3	3			3	3

Unit No	Contents	Mapped COs
1	Introduction to Python: Features of Python, Writing and Executing First Python Program, Literal Constants, Variables and Identifiers, Reserved Words, Data Types, Input Operation, Operators and Expressions, Operations on Strings, Type Conversion, Conditional statements and iterative statements.	CO1
2	Functions and Strings in python Functions: Introduction, Built-in Math Functions, User Defined Functions: Function Call, Variable Scope and Lifetime, The return statement, Lambda Functions, Modules and Packages in python. Strings: Introduction, Built-in String Functions, Slice Operation, Comparing Strings, Iterating String, Regular Expressions.	CO1, CO2
3	Data Structures Lists: Accessing values in lists, Nested Lists, Basic List Operations. Tuples: Creating Tuple, Accessing values in a tuple, Basic Tuple Operations. Dictionaries: Creating and Accessing Dictionaries, Built-in Dictionary functions, List Vs Tuple Vs Dictionary. Sets: Creating a Set and set operations	CO1, CO3
4	Python data computation libraries Pandas: Dataframe, Data manipulation, reshaping and pivoting of dataset, merging and joining of data sets, data slicing, subsetting. Numpy: Creating arrays, array indexing, array slicing, array reshape, array iterating, array join, array split, array search, array sort, array filter.	CO1, CO4
5	Python data computation libraries SciPy: SciPy vs Numpy, Introduction to SciPy subpackages. Python data visualization libraries Matplotlib: Scatter plot, line chart, Histogram, Bar chart. Seaborn: Scatter plot, line chart, Histogram, Bar chart.	CO1, CO4

Course Content - Practical

Expt. No	Contents	Mapped CO
1	Python programs on usage of operators.	CO1
2	Python Programs to demonstrate decision making and branching (Selection)	CO1
3	Python programs to demonstrate iterative statements.	CO1
4	Python programs to demonstrate functions	CO2
5	Python program to demonstrate modules and packages	CO2
6	Python programs to perform operations on strings, regular expressions with built – in functions	CO2
7	Python programs to apply List, Tuple data structures.	CO3
8	Python programs to apply Set, Map data structures.	CO3
9	Installing, importing accessing and computations on a dataset using Pandas library	CO4
10	Installing, importing accessing and computations on a dataset using Numpylibrary	CO4
11	Installing, importing and visualization of dataset using Pandas and Matplotlib libraries.	CO4
12	Installing, importing and visualization of dataset using Seaborn library.	CO4

Learning Resources

Text Books

1. *Python Programming using Problem Solving Approach* by ReemaThareja, 2017, OXFORD University Press
2. *Python Programming: Problem Solving, Packages and Libraries* by Anurag Gupta and G.P. Biswas,2020, McGraw Hill

References

1. *Core Python programming* by R. NageswaraRao, 2018, Dreamtech press.
2. *Programming with python* by T R Padmanabhan, 2017, Springer.

E-Recourses and other Digital Material

1. <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/lecture-videos/>
2. <https://www.python.org/>
3. <http://www.ict.ru.ac.za/Resources/cspw/thinkcspy3/thinkcspy3.pdf>