SUBJECT: COMPUTER SCIENCE							
DSE	**BCS-C702**	**Python Programming**	**L**	**T**	**P**	**C**	**Time for ESE**
			4	**-**	**-**	**4**	**3 Hrs.**

Pre- requisite: Basic understanding of computer programming.

Course Objectives:

- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.

Course Outcomes:

CO1	Able to apply the principles of python programming.
CO2	Create applications using python programming.
CO3	Implementing database using SQLite.
CO4	Access database using python programming.
CO5	Develop web applications using python programming.

Course Contents

UNIT	Contents	Lectures Required
1.	**Introduction to Python:** History, Features, setting up path, working with Python, Basic Syntax, Variable and Data Types, Operator. **Conditional Statements & Looping:** If, If- else, Nested if-else, For, While, Nested loops, Break, Continue, Pass. **String Manipulation:** Accessing Strings, Basic Operations, String slices, Function and Methods, Formatting strings.	8
2.	**Lists, Tuple and Dictionaries:** Lists – Introduction, accessing list, Operations, working with lists, Function and Methods, Tuple – Introduction, accessing tuples, Operations, Working, Functions and Methods, Dictionaries - Introduction, accessing values in dictionaries, working with dictionaries, Properties, Functions. **Functions:** Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Function documentation, Keyword and optional parameters, *args and **kwargs, passing collection to a function, variable number of arguments, scope, functions – "First Class Citizens", Passing functions to function, mapping functions in a dictionary, Global and local variables.	10
3.	**Modules:** Importing module, Math module, Random module, Packages, Composition, dir function **Input-Output:** Printing on screen, reading data from keyboard, Opening and closing file, Reading and writing files, Working with Directories, Metadata. **Object and Classes:** Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, File Organization, Special Methods, Class	10

	Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes.	
4.	**Error Handling:** Handling IO Exceptions, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions. **Regular expressions:** Match function, Search function, Matching VS Searching, Modifiers Patterns.	10
5.	**CGI:** Introduction, Architecture, CGI environment variable, GET and POST methods, Cookies, File upload. **Database:** Introduction, Connections, Executing queries, Transactions, Handling error.	10
	Total Lectures	48

Suggested Text Book(s):

1.	Gowrishankar S, Veena A, Introduction to Python Programming, CRC Press
2.	Mark Lutz, Learning Python, O'Reilly Media

Suggested Reference Book(s):

1.	Kenneth A. Lambert, The Fundamentals of Python: First Programs, Cengage Learning.
2.	Chun, Wesley. Core python programming. Vol. 1. Prentice Hall Professional.

Other Useful Resource(s)

1.	https://onlinecourses.nptel.ac.in/noc18_cs35/preview
2.	https://nptel.ac.in/courses/106106145/
3.	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/index.htm
4.	https://docs.python.org/3/tutorial/index.html

Course Outcomes Contributed to Programme Outcomes

PO→ CO↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	AVERAGE
CO1	3	3	3	1	1	3	1	1	**2.0**
CO2	3	3	1	2	3	2	2	3	**2.4**
CO3	3	3	1	2	2	2	2	2	**2.1**
CO4	3	3	2	2	1	3	2	2	**2.3**
CO5	2	3	1	3	3	3	2	3	**2.5**
AVG.	**2.8**	**3.0**	**1.6**	**2.0**	**2.0**	**2.6**	**1.8**	**2.2**	**2.3**

Course Outcomes Contributed to Programme Specific Outcomes

PSO→ CO↓	PSO1	PSO2	PSO3	AVERAGE
CO1	3	3	2	**2.7**
CO2	2	3	3	**2.7**
CO3	2	3	2	**2.3**
CO4	2	3	2	**2.3**
CO5	2	3	3	**2.7**
AVG.	**2.2**	**3.0**	**2.4**	**2.6**