COURSE STRUCTURE

CourseCode	BCA10060				
CourseCategory	Program Foundation				
CourseTitle	Python				
Teaching Scheme	Lectures	Tutorial	Laboratory / Practical	Project	Total
Weekly load hours	2	-	2	-	3
Credits	2	-	1	-	3
Assessment Schema Code	TL4				

Pre-requisites: Basic understanding of Computer Programming terminologies. A basic understanding of any of the programming languages.

- **Course Objectives:** To understand the concept of Python.

Course Outcomes:

1. On completion of the course, student will be able to–
2. To understand why Python is a useful scripting language for developers.
3. To learn how to design and program Python applications.
4. To learn how to use lists, tuples, and dictionaries in Python programs.
5. To learn how to identify Python object types.
6. To define the structure and components of a Python program.
7. To learn how to write loops and decision statements in Python.

Course Contents:

Unit- I: Introduction to Python [2]

History
Features
Setting up path
working with Python
Basic Syntax
Variable and Data Types
Operators

Unit- II : Conditional Statements and Loops[6]

If, If- else, Nested if-else
For Loop, While Loop, Nested Loop
Break, Continue, Pass
Using Strings
Accessing Strings
Basic Operations

String slices
Function and Methods

Unit III: Lists, Tuple and Dictionaries,Sets[8]

Lists – Introduction
Creating and Accessing elements
Updating and deleting lists,traversing ,reversing a list
Built in list operators ,Function and Methods
Tuples:-Introduction, Accessing tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, and Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in tuple functions, indexing, slicing and matrices. Dictionaries:-Introduction,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

Sets- Definition, transaction of set(Adding, Union, intersection), working with sets

Unit IV: Functions[3]
Defining a function,
calling a function
Types of functions
Function Arguments
Anonymous functions
Global and local variables

Unit V: Modules and Packages[2]
Importing module
Math module
Random module
Packages Composition
Overview of OOP[2]
Creating Classes and Objects
Class attributes:-Class and Instance Variables
Class methods,Instance methods,Static Methods
Inheritance in Python

Unit VI: Python Libraries[7]
Numpy
NumPy ndarray - Vectorization Operation - Array
Indexing and Slicing - Transposing Array
and Swapping Axes - Saving and Loading Array - Universal
Functions - Mathematical and
Statistical Functions in Numpy
Pandas
Series and DataFrame data structures in pandas -
Creation of Data Frames – Accessing the
columns in a DataFrame - Accessing the rows in a
DataFrame - Panda's Index Objects -
Reindexing Series and DataFrames - Dropping entries from

Series and Data Frames - Indexing, Selection and Filtering in Series and Data Frames - Arithmetic Operations between Data Frames and Series - Function Application and Mapping.
LearningResources: **Reference Books:** 1.Dive into Python by Mark Pilgrim 2. Programming Python by Mark Lutz, O'Reilly Media 3. Python Testing Cookbook by Greg L. Turnquist 4. Head First Programming by Paul Barry and David Griffiths 5. Python Programming: An Introduction to Computer Science by John Zelle **Supplementary Reading:** Python Programming: An Introduction to Computer Science by John Zelle **Weblinks:** https://docs.python.org/3/tutorial/index.html www.w3schools.com/python/ **https://www.tutorialspoint.com/python/index.htm** MOOCs: Online courses for self-learning Courses by NPTEL and MIT Open Courseware etc **Pedagogy:** 4. Participative Learning, 5. discussions, 6. algorithm, 7. programming concepts, 8. experiential learning through practical problem solving, 9. assignments.

Sr. No.	Practicals to be conducted on
1	**Conditional Statements**
2	**Lists, Tuple and Dictionaries,Sets**
3	Functions
4	Modules and Packages
5	Classes and Objects
6	Python Libraries