MCAC0019: PROBLEM SOLVING USING PYTHON

Objective: *This course introduces the solving of mathematical problems using Python programming using advance concepts and its implementations*

Credits: 03 **L–T–P–J: 3–0–0–0**

Module No.	Content	Lab Hours
I	**Introduction to Programming problems:** Basic Programming Concepts, Python: Introduction and Basics; Setting up path Python Data Variables & Operators: Data Variables and its types, id() and type() functions, Coding Standards; **Control Statements:** if-else, elif, Nested if, Iteration Control structures, Break, Continue & Pass; **Immutable Datatypes:** **Boolean Datatypes:** Introduction and use **Strings:** Accessing Strings, Basic Operations, String slices Function and Methods. **Tuple:** Introduction, accessing tuples, Operations, Working, Functions and Methods. **Mutable Datatypes:** **Lists:** Introduction, accessing list, Operations, Working with lists, Function and Methods. **Dictionaries:** Introduction, accessing values in dictionaries, Working with dictionaries, Properties, Functions. **Functions:** Defining & Calling a function, Passing arguments to functions – Mutable & Immutable Data Types, Different types of arguments, Recursion, Scope of variables;	18
II	**Packages and Modules:** User-defined modules and Standard Library: random, sys, Math Module, String Module, List Module, Date & Time Module, Regular Expressions: match, search, replace; Introduction to PIP, Installing Packages via PIP **Input-Output:** Printing on screen, reading data from keyboard, Opening and closing file, Reading and writing files, Functions. **Object Oriented Programming:** Creating Classes, Instance Variables & Access Specifiers, Methods & Complete Python Program, Importance of self, __init__ () method, Instance Methods **Exception Handling:** Exception, Exception Handling, except clause, Try and catch, finally clause, User Defined Exceptions. ,	18

Text Books:

- Paul Barry: "Head First Python "O'Reilly Media, Inc.", 2010.

Reference Books:

- Bret Slatkin: "Effective Python: 59 Specific ways to write better Python", Addison Wesley, 2015.

Outcome: *By the end of the class, students will learn to:*

- *Understand to solve problems with smaller Lines of Code using Python as compared to other programming languages.*
- *use OO concepts while programming in Python.*
- *use in-built packages defined in Python.*
- *work with Python using GUI.*

MCAC0811: PROBLEM SOLVING USING PYTHON LAB

Credits: 02 **L–T–P–J: 0–0–4–0**

Module No.	Content	Lab Hours
I	Programs based on the concepts of: ● OOP's ● Input from user ● Printing desired output Programs based on the concepts of: ● Conditional if statements ● Nested if statements ● continue Programs based on the concepts of Iteration using different kinds of loops Usage of Data Structures ● Strings ● Lists ● Tuples ● Dictionary Programs related to Object Oriented Concepts: Creating Classes, Instance Variables, Access Specifiers, User defined Methods, Importance of self, __init__() method, Class Methods and Static Methods, Using default parameters in Methods. Handling Database Connectivity with Python: ● Inserting and Retrieving Data ● Use of Stored Procedures ● Invoking stored functions	24

Text Books:

- Paul Barry: "Head First Python "O'Reilly Media, Inc.", 2010.

Reference Books:

- Bret Slatkin: "Effective Python: 59 Specific ways to write better Python", Addison Wesley, 2015.

Outcome: By the end of the course, students will learn to:

- solve problems with smaller Lines of Code using Python
- use OO concepts while programming in Python
- use in-built packages defined in Python
- use front-end as Python Programming to connect with any back-end