

PAPER CODE: CSC5310

PAPER - VIII: Self-learning : Python Programming [Credits - 2: No. of Lectures 24]

Prerequisites:

- Anyone who has a mature understanding of programming in an imperative language (e.g., Java, C/C++, or Pascal), of basic algorithms and data structures (e.g., sorting, searching, lists, stacks, and trees)

Objectives:

- To study python programming.
- To design the scripts in python.
- To design graphical user interface using python.

	Title and Contents	No. of Lectures
Unit - I	Introduction to Python Python identifiers and reserved words, Lines and indentation, multi-line statements, comments, print and raw_input()/input, command line arguments and processing command line arguments, standard data types basic, none, boolean (true & False), numbers, Python strings, data type conversion, Python basic operators (Arithmetic, comparison, assignment, bitwise logical), Python membership operators (in & not in), Python identity operators (is & is not), Operator precedence, Control Statements, Python loops Iterating by subsequence index, loop control statements (break, continue, pass) , Mathematical functions and constants (import math), Random number functions	3
Unit - II	Python strings & Lists Python Modules Concept, Slicing, escape characters, String special operations, String formatting operator, Triple quotes, \ Raw String, Unicode strings, Built-in String methods. Python Lists concept, creating and accessing elements, updating & deleting lists, basic list operations, reverse, Indexing, slicing and Matrices, Built-in List functions, filter(), map(), and reduce(), Using Lists as stacks and Queues,	3

	List comprehensions	
Unit - III	Python tuples, sets and dictionary Concept (immutable), creating & deleting tuples, accessing values in a tuple, updating tuples, delete tuple elements, basic tuple operations, Indexing, slicing and Matrices, Built-in tuple functions. Sets - Concept, operations. Dictionary Concept (mutable), creating and accessing values in a dictionary , updating dictionary, delete dictionary elements, properties of dictionary keys Built-in dictionary functions and methods.	4
Unit - IV	Functions Defining a function (def), calling a function, Function arguments - Pass by value, Keyword Arguments, default arguments, Scope of var - basic rules and Documentation Strings Variable Number of Arguments, Call by Reference, Order of arguments (positional, extra & keyword), Anonymous functions Recursion Treatment of Input and Output Arguments, Unpacking argument lists Lambda forms Function Objects Function ducktyping & polymorphism, generators (functions and expressions) and iterators, list comprehensions	4
Unit - V	Working with Files and Directories Creating files Operations on files (open, close, read, write), file object attributes, filepositions, Listing Files in a Directory, Testing File Types, Removing Files and Directories Copying and Renaming Files Splitting Pathnames, Creating and Moving to Directories, Traversing Directory Trees	4
Unit - VI	Python Classes / Objects Object oriented programming and classes in Python - creating classes, instance objects, accessing members, data hiding (the double underscore prefix) Built-in class attributes Garbage collection, the constructor, overloading methods and operators Inheritance - implementing a subclass, overriding	3

	methods, Recursive calls to methods, Class variables, class methods, and static methods	
Unit - VII	Python regular expressions Matching Vs searching, match & search functions, search & replace, option flags, RE patterns, non-greedy repetitions, grouping, back references, alternatives, anchors.	1
Unit - VIII	GUI Programming The simplest GUI program in Python Event-driven programming. Changing the layout. Getting input from the user. GUI Examples: Designing a GUI.	2
References: <ol style="list-style-type: none"> 1. Bruce J. Maclennan, Functional Programming: Practice and Theory 2. Greg Michaelson , An Introduction to Functional Programming Through Lambda Calculus (Dover Books on Mathematics) Paperback 3. Kenneth C. Loudon, Programming Languages: Principles and Practice 4. E-Books : python_tutorial. pdf, python_book_01.pdf Mark Lutz , Learning Python, O'reilly 		
Note: The evaluation is for 50 Marks based on above concepts.		