Subject Name : Python Programming

Subject Code CE 605-3 / IT 605-3

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	04	07	5	3	70	30	20	30	150

Learning Objectives:

Computer programming skills are now becoming part of basic education as these skills are increasingly of vital importance for future job and career prospects. The Python programming language which is one of the most popular programming languages worldwide. The course shows you how to use the free open-source Python to write basic programs and high level applications using concepts such as Class, BIF of Python, functions, variables, If Else statements, For loops, While loops, iterative and recursive programs and algorithms such as the Insertion Sort algorithm. This course will be of great interest to all learners who would like to gain a thorough knowledge and understanding of the basic components of computer programming using the Python language – and might be a gentle introduction to programming for those who think they might have a longer term interest in the subject area.

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction to Python Programming Language.	4
2	Data Collections and Language Component	6
3	Object and Classes	12
4	Functions and Modules	11
5	I/O and Error Handling In Python	12

Total hours (Theory): 45

Total hours (Lab): 60

Total hours: 105

Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weightage(%)
1	**Introduction to Python Programming Language. :** **Introduction to Python Language,** • Strengths and Weaknesses, • IDLE, Dynamic Types, • Naming Conventions, • String Values, • String Operations, • String Slices, • String Operators, • Numeric Data Types, • Conversions, • Built In Functions	4	10
2	**Data Collections and Language Component :** • Introduction, • Control Flow and Syntax, • Indenting, • The `if` Statement, • Relational Operators, • Logical, • Operators, • True or False, • Bit Wise Operators, • The `while` Loop, `break` and `continue`, • The `for` Loop, Lists, • Tuples, • Sets, • Dictionaries, • Sorting Dictionaries, • Copying Collections.	6	20
3	**Object and Classes :** • Classes in Python • Principles of Object Orientation • Creating Classes • Instance Methods • File Organization	12	25

	• Special Methods • Class Variables • Inheritance • Polymorphism • Type Identification • Custom Exception Classes		
4	**Functions and Modules :** • Introduction • Defining Your Own Functions • Parameters • Function Documentation • Keyword and Optional Parameters • Passing Collections to a Function • Variable Number of Arguments • Scope • Functions - "First Class Citizens" • Passing Functions to a Function • Mapping Functions in a Dictionary • Lambda • Modules • Standard Modules – `sys` • Standard Modules – `math` • Standard Modules – `time` • The `dir` Function	11	25
5	**I/O and Error Handling In Python :** • Introduction • Data Streams • Creating Your Own Data Streams • Access Modes • Writing Data to a File • Reading Data From a File • Additional File Methods • Using Pipes as Data Streams • Handling IO Exceptions • Working with Directories • Metadata • Errors • Run Time Errors • The Exception Model • Exception Hierarchy • Handling Multiple Exceptions	12	20
	Total	**45**	**100**

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Learning Outcome:

- Able to apply the principles python programming.
- Write clear and effective python code.
- Create applications using python programming.
- Implementing database using SQLite.
- Access database using python programming.
- Develop web applications using python programming.
- Develop and use Web Services using python.

Reference Book:

1. Dive into Python, Mike
2. Learning Python, 4th Edition by Mark Lutz
3. Programming Python, 4th Edition by Mark Lutz

List of experiments:

Sr. No	Name of Experiment
1	Write python program to print Hello World
2	Write python program to Hello World using string variable
3	Write python program to store data in list and then try to print them.
4	Write python program to do basic trim and slice on string.
5	Write python program to print list of numbers using range and for loop
6	Write python program to store strings in list and then print them.
7	Write python program to let user enter some data in string and then verify data and print welcome to user.
8	Write python program in which an function is defined and calling that function prints Hello World
9	Write python program in which an function(with single string parameter) is defined and calling that function prints the string parameters given to function.
10	Write python program in which an class is define, then create object of that class and call simple print function define in class.