(Master of Science in Statistics) (Master of Science) (M. Sc.) (Statistics) Semester (I)

Course Code	PS01ESTA51	Title of the Course	INTRODUCTION OF PYTHON PROGRAMMING
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	This course covers the basics and advanced Python programming to harness its potential for modern computing requirements. Python is a modern language useful for writing compact codes specifically for programming in the area of Data Analytics and scientific computing.

Course Content		
Unit	Description	Weightage* (%)
1.	Introduction to Python: The basic elements of python, creating and running python programs, Data types in Python, variables and variable naming. Collection data types – sequence types, set types. Python statements – Assignment, Control structures – Conditional branching and loops. List comprehensions, Dict comprehensions; iterators, iterables and generators.	25
2.	Library functions and user defines functions, Local and recursive functions, Lambda functions. Exception handling. Python Modules and packages – importing a module/ package in a Python program, Developing custom modules and packages. Overview of Python's standard library – string handling, mathematics and numbers, Times and Dates, File, Directory and Process handling	25
3.	Object Oriented Programming : Object Oriented concepts and terminology, defining classes – attributes and methods. Inheritance, understanding and using access control, multiple inheritance, polymorphism` Creating collection classes. Debugging, testing and Profiling Python code	25
4.	SciPy – A Python based Open Source Software for scientific computing:	25

	IPython - A platform for interactive computing with Python; IPython basics, using command history, interacting with OS, Software development tools. NumPy - The fundamental package for scientific computing with Python Pandas - An open source library providing high-performance, easy-to-use data structures and data analysis tools for the Python SciPy library - Library for scientific computing MatPlotLib – A library for creating 2D plots SymPy - A Python library for symbolic computing	
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Teaching-Learning Methodology	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	understand the basic elements of python
2.	write programs for various applications using python. They will also be aware about various available libraries that can be helpful while programming.

Suggested References:

Sr. No.	References
1.	Summerfield, M. (2010). Programming in Python 3, 2E, Addison-Wesley.
2.	Blanco-Silva, F. J. (2013)Learning SciPy for Numerical and Scientific Computing, Packt Publishing
3.	Introduction to Computation and Programming Using Python by John V Guttag, Prentice Hall of India
4.	Core Python Programming by R. Nageswara Rao, dreamtech
5.	Core Python Programming by Wesley J. Chun, Prentice Hall
6.	Data Structures and Algorithms in Pyhon by Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, Wiley
7.	Fundamentals of Python –First Programs by Kenneth A. Lambert, Cenagepublication
8.	Luke Sneeringer, "Professional Python", Wrox

On-line resources to be used if available as reference material
On-line Resources

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