

NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	Integrated B.Tech.(CSE)-MBA
Course Code:	CSI0506
Course Title:	Python Programming
Course Type:	Core
Year of Introduction:	2021-22

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
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Course Learning Outcomes (CLO):

At the end of the course, students will be able to –

1. interpret the basics of Python programming
2. apply standard programming constructs like repetition, selection, functions, composition, modules, aggregated data
3. design Python programs to solve real world problems

Syllabus:

Laboratory work will be based on following topics and minimum 7 experiments will be conducted.

Introduction to Computational Science: Introduction, Applications involving scientific computing, Tools and languages to solve complex scientific problems

Programming in Python: Basics of Python, Interpreter and its environment; Introduction to data types, concepts of mutability, operators and variables; random numbers, user inputs, statements; branching, conditional and iteration; functions, File handling, Error handling and exceptions

Array handling, numPy, Matplotlib: Array computing and curve plotting, vectors and higher-dimensional arrays, matrices, numPy, Matplotlib

Python Pandas: Introduction, Data alignment, aggregation, summarization, computation and analysis with Pandas

Scientific computation using python: Introduction, Statistical data analysis

Self-Study: -NA-

- Suggested Readings/
References:
1. Hans Petter Langtangen, A Primer on Scientific Programming with Python, Springer
 2. Claus Fuhrer, Jan Erik Solem, Olivier Verdier, Scientific Computing with Python 3, Packt Publishing Limited
 3. Martin C. Brown, Python: The Complete Reference, McGraw Hill Education
 4. Hemant Kumar Mehta, Mastering Python Scientific Computing, Packt Publishing Limited
 5. Sergio J. Rojas G., Erik A. Christensen, Francisco J. Blanco-Silva,

Learning SciPy for Numerical and Scientific Computing, Packt
Publishing Limited

Suggested List of Experiments:	Sr. No.	Title	Hours
	1.	To install the software IDE on the system.	04
	2.	To implement basic programs for python basic data types and conversion between different data types.	06
	3.	To create python programs which demonstrate the concepts function, random numbers, branching, conditional and iteration statements.	06
	4.	To develop python programs for user inputs and python data types like list, set.	04
	5.	To implement the python programs for file handling concepts.	02
	6.	To implement the python programs for exception handling concepts.	02
	7.	To develop python programs using Numpy and Scipy concepts.	04
	8.	To create python programs using Numpy API concepts.	04
	9.	To plot the graph(s) using Matplotlib and its concepts.	04
	10.	To perform and exemplify data alignment, aggregation and summarization concepts using Python Pandas.	04
		To learn and create python programs for statistical data analysis concepts.	04

Suggested Case List: -NA-