

CSE11118	Introduction to Python	L	T	P	C
Version 1.0	Contact Hours 45	3	0	0	3
Pre-requisite/Exposure	10+2 Level Mathematics, Knowledge of Basics of Computer				
Co-requisite	NIL				

Course Objectives:

- To understand the concept of programming using pythonTo apply numerical computations using numpy
- To apply scientific computations using scipyTo visualize trends in data using matplotlib
- To perform machine learning operations using sklearn

Course Outcomes:

On the completion of this course the student will be able to

CO1: Understand the basic concepts of python

CO2: Understand database management using python **CO3 :** Apply numerical computation with python

CO4: Compare scientific computation methods with python**CO5 :** Visualize trends in the data with python

Course Description:

Data is the new Oil. This statement shows how every modern IT system is driven by capturing, storing and analysing data for various needs. Be it about making decision for business, forecasting weather, studyingproteinstructures in biology or designing a marketing campaign. All of these scenarios involve a multidisciplinary approach of using mathematical models, statistics, graphs, databases and of course the business or scientific logicbehind the data analysis. So we need a programming language which can cater to all these diverse needs of datascience. Python shines bright as one such language as it has numerous libraries and built in features which makesit easy to tackle the needs of Data science. In this course we will cover these the various techniques used in datascience using the Python programming language.

Course Content:

Units	Lecture Hours
Unit-I: Introduction to Python :Datatypes, expressions, statements, conditions, loops, classes, objects, functions, datastructures, I/O, packages.	9
Unit-II: Data Handling with Pandas: DataFrames, Series, loading and saving, alignment, missing data, reshaping, pivoting,slicing, indexing, subsetting, insertion/deletion, merge and join, time series.	9

Units	Lecture Hours
Unit-III: Numerical computation: ndarrays, datatypes, mathematical and logical operations, linear algebra, fourier transforms, random, searching, sorting, import and export data.	9
Unit-IV: Scientific computations: Physical and mathematical constants, Fourier transform, Integration routines, Interpolation, Data input and output, Linear algebra routines, Optimization, Signal processing, Sparse matrices, Spatial data structures and algorithms, Any special mathematical functions, Statistics	9
Unit-V: Data visualization: Chart properties, styling, box plots, heatmaps, scatterplots, bubble charts, 3d charts, time series, geographical data, graph data.	9

Text Books:

- Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython - Wes McKinney
- Machine Learning with Python Cookbook: Practical Solutions from Preprocessing to Deep Learning
- Chris Albon-

Reference Books:

- Introduction to Machine Learning with Python: A Guide for Data Scientists by Andreas C. Müller, Sarah Guido-
- Learning Python: Powerful Object-Oriented Programming, Mark Lutz-

Modes of Evaluation:

Quiz/Assignment/Presentation/Extempore/ Written

Examination Examination Scheme:

1 = Weakly Mapped

2 = Moderately Mapped 3 = Strongly Mapped