

Python for Data Analytics

Course Code: VAC-CS-PDA

L-T-P : 3-0-3

Theory Contact hours: 15

Practical Contact hours: 15

Total : 30 Hours

Course Objective: The objective of this course is to provide comprehensive knowledge of python programming paradigms required for Data Analytics.

Prerequisite: Introduction to Python: Features, Basic Syntax, Variable and Data Types, Operator, Conditional Statements, Loops, Control Statements. Working with Lists, Tuples, dictionary, Functions, Classes and Modules, Exception handling. Introduction to Tableau: Tableau tool for Data Analysts, data visualization, reporting and SQL with real-life industry projects.

Unit	Content	Hrs/Unit
1	MODULE 1: INTRODUCTION TO PYTHON Python Program- Basic Module Execution, Branching and Looping, Problem Solving Using Branches and Loops, Functions, Lists.	3
2	MODULE 2: SEQUENCE DATATYPES AND OBJECT-ORIENTED PROGRAMMING Sequences, Mapping and Sets, Dictionaries, Classes: Classes and Instances, Inheritance, Exceptional Handling.	3
3	MODULE 3: USING NUMPY Basics of NumPy, Aggregations, Computation on Arrays, Comparisons, Masks and Boolean Arrays, Fancy Indexing, Sorting Arrays, Structured Data: NumPy's Structured Array.	3
4	MODULE 4: DATA MANIPULATION WITH PANDAS Introduction to Pandas Objects, Data indexing and Selection, Operating on Data in Pandas, Handling Missing Data, Hierarchical Indexing, Combining Data Sets, Aggregation and Grouping, Pivot Tables.	3
5	MODULE 5: VISUALIZATION AND MATPLOTLIB Basic functions of matplotlib, Simple Line Plot, Scatter Plot, Density and Contour Plots, Histograms, Binnings and Density, Customizing Plot Legends, Colour Bars, Three, Dimensional Plotting in Matplotlib.	3

Practical Component: Hardware requirement: • i5 Processor, 8GB RAM, Internet
Connection Software Environment: • Google Colab notebook/ JUPYTER notebook, Tableau for data cleaning.

Laboratory/Practical:

1. Demonstrate usage of branching and looping statements
2. Demonstrate Recursive functions
3. Demonstrate Lists
4. Demonstrate Tuples and Sets
5. Demonstrate Dictionaries
6. Demonstrate inheritance and exceptional handling
7. Demonstrate Aggregation
8. Demonstrate Indexing and Sorting
9. Demonstrate handling of missing data
10. Demonstrate hierarchical indexing
11. Demonstrate Scatter Plot
12. Demonstrate 3D plotting

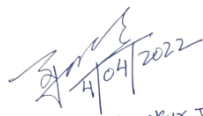
Text book and Reference books:

Essential Reading

- [1] Jake VanderPlas, Python Data Science Handbook - Essential Tools for Working with Data, O'Reilly Media Inc., 2016.
- [2] Zhang.Y, An Introduction to Python and Computer Programming, Springer Publications, 2016.

Recommended Reading

- [1] Joel Grus , Data Science from Scratch First Principles with Python, O'Reilly Media, 2016.
- [2] T.R.Padmanabhan, Programming with Python, Springer Publications, 2016.



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