Semester-VII

Discipline Specific Elective-DSE-II 7.1

Hands-on Python

Offered by Economics Department, College of Vocational Studies

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Semester	Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
			Lecture	Tutorial	Practical/ Practice		
VII	Hands-on Python	4	1	0	3	Class 12th Pass	NIL

Course Objectives:

The objective of this course is to equip students with the fundamental knowledge and practical skills in Python programming. It will enable the students in understanding usefulness of Phyton as an analytical tool in diverse fields. They will learn how to use lists, tuples, dictionaries, and functions programs. They will be prepared to use the program for managing data frames, visualising datasets and performing simple statistical calculations.

Course learning outcomes:

After completion of the course students will be able to:

1. Describe the concepts of constants, variables, data frames and operators.
2. Write programs using list, tuple, set and strings handling functions.
3. Write programs using user-defined functions and python dictionary.
4. Create data frames and transform and aggregate them through slicing, merging and visualising.
5. Visualise and present data sets with the help various types of charts and graphs.
6. Calculate measures of central tendency and measures of dispersion.

Unit 1: Introduction to Python Programming [10 Hours]

Introduction to Python and its features, Setting up the Python Development Environment, Basic Python syntax and data types, Variables, operators, and expressions in Python, Python List, Tuples, Python Dictionaries, Functions and Packages, NumPy

Unit 2: Data Manipulation with Pandas [10 Hours]

Transforming DataFrame, Aggregating DataFrame, Slicing and Indexing DataFrame, Creating and Visualizing DataFrame, Data Merging Basics, Merging Tables With Different Join Types, Advanced Merging and Concatenating

Unit 3: Data Visualization and Analysis [10 Hours]
Introduction to data visualization libraries (Matplotlib, Seaborn), Plotting and customizing charts and graphs, Exploratory data analysis using Python, Presenting insights and findings with visualizations, Creating interactive and appealing data visualizations

Unit 4: Statistics with Python [15 Hours]
Data Classification (Discrete, Continuous, Categorical), Mean, Median, Mode, Variance, Standard Deviation, Quartile, Percentile, Inter-quartile Range, Identifying outliers, correlation

Suggested Readings:

- VanderPlas, J. (2016). Python Data Science Handbook: Essential Tools for Working with Data. O'Reilly Media.
- Downey, A. B. (2014). Think Stats: Exploratory Data Analysis in Python (2nd ed.). O'Reilly Media.

Notes:

1. Suggested readings shall be updated and uploaded on the college website from time to time.

2. Examination scheme and mode shall be prescribed by the Examination branch, University of Delhi from time to time.