**Academic Teaching Plan**

**GE Paper-Data Analysis and Visualization using Python**

**B.Sc. Phy. Sci. Sem-2**

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| Week 1 | Introduction to basic statistics and analysis: Fundamentals of Data Analysis, Statistical foundations for Data Analysis, Types of data. |
| Week 2 | Descriptive Statistics, Correlation and covariance, Linear Regression, Statistical Hypothesis Generation and Testing Python Libraries: NumPy, Pandas, Matplotlib |
| Week 3 | Array manipulation using Numpy: NumPy array: Creating NumPy arrays, various data types of NumPy arrays Indexing and slicing, swapping axes, transposing arrays, data processing using Numpy arrays. Assignment |
| Week 4 | Data Manipulation using Pandas: Data Structures in Pandas: Series, Data Frame, Index objects, loading data into Panda’s data frame, Working with Data |
| Week 5 | Frames: Arithmetics, Statistics, Binning, Indexing, Reindexing, Filtering, Handling missing data, Hierarchical indexing, Data wrangling: Data cleaning, transforming, merging and reshaping |
| Week 6 | Plotting and Visualization: Using Matplotlib to plot data: figures, subplots, markings, color and line styles, labels and legends, Plotting functions in Pandas: Lines, bar, Scatter plots, histograms, stacked bars, Heatmap |
| Week 7 | Test |