Lesson Plan &Work-done Diary for AY: 2025-26, EVEN Semester

Course with Code: Exploratory Data Analysis- **BDS613B**				**Faculty: Dr. Anitha D B**			**Semester & Section:** 6A	
Class No.	Date planned **(DD/MM)**	Topics to be covered	**TLP Planned**	**Class No.**	**Date of Conduction (DD/MM)**	**Topics Covered**	**TLP Executed**	**Remarks if any deviation**
MODULE 1- Introduction to Python and NumPy								
1.		Getting Started in IPython	Chalk & Talk PPT, Jupyter					
2.		Getting Started in Jupyter	Chalk & Talk PPT, Jupyter					
3.		Enhanced Interactive Features	Chalk & Talk PPT, Jupyter					
4.		The Basics of NumPy Arrays	Chalk & Talk PPT, Jupyter					
5.		Sorted Arrays	Chalk & Talk PPT, Jupyter					
6.		Structured Data	Chalk & Talk PPT, Jupyter					
7.		NumPy's Structured Arrays	Chalk & Talk PPT, Jupyter					
8.		Revision, Quiz	Chalk & Talk PPT, Jupyter					

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MODULE 2- Data Manipulation with Pandas - I								
9		Introducing Pandas Objects.	Chalk & Talk PPT, Jupyter					
10		Pandas Objects: Series objects, Constructing Series objects	Chalk & Talk PPT, Jupyter					
11		The Pandas DataFrame Object, Constructing DataFrame objects,The Pandas Index Object	Chalk & Talk PPT, Jupyter					
12		Handling Missing Data- Trade-Offs in Missing Data Conventions.	Chalk & Talk PPT, Jupyter					
13		Missing Data in Pandas, Operating on Null Values.	Chalk & Talk PPT, Jupyter					
14		Hierarchical Indexing- A Multiply Indexed Series, Methods of MultiIndex Creation, Multiply indexed DataFrames.	Chalk & Talk PPT, Jupyter					
15		Multi-Indices, Rearranging Multi-Indices, Index setting and resetting, Data Aggregations on Multi-Indices	Chalk & Talk PPT, Jupyter					
16		Pivot Tables. Pivot Tables by Hand	Chalk & Talk PPT, Jupyter					
17		Pivot Table Syntax, Multi-level pivot tables.	Chalk & Talk PPT, Jupyter					

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MODULE 3 - Data Manipulation with Pandas - II								
18		**Vectorized String Operations**: Introducing Pandas String Operations, Tables of Pandas String Methods.	Chalk & Talk PPT, Jupyter					
19		Methods using regular expressions	Chalk & Talk PPT, Jupyter					
20		Vectorized item access and slicing, A simple recipe recommender	Chalk & Talk PPT, Jupyter					
21		Working with Time Series: Dates and Times in Python, Dates and times in pandas: best of both worlds, Pandas Time Series: Indexing by Time	Chalk & Talk PPT, Jupyter					
22		Pandas Time Series Data Structures, Resampling, Shifting, and Windowing, Resampling and converting frequencies, Time-shifts, Rolling windows,example.	Chalk & Talk PPT, Jupyter					
23		High Performance Pandas: Motivating query() and eval(): compound Expressions, Operations supported by pd.eval(), DataFrame.eval() for Column-Wise Operations	Chalk & Talk PPT, Jupyter					
24		Assignment in DataFrame.eval(),Local variables in DataFrame.eval(), DataFrame.query() Method, Performance: When to Use These Functions	Chalk & Talk PPT, Jupyter					
25		Column wise operations pd.eval, DataFrame.eval and query	Chalk & Talk PPT, Jupyter					

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MODULE 4 - Data Visualization with MatPlotlib								
26		General Matplotlib Tips	Chalk & Talk PPT, Jupyter					
27		Simple Line Plots: Adjusting the Plot: Line Colors and Styles	Chalk & Talk PPT, Jupyter					
28		Adjusting the Plot: Axes Limits**,** Labeling Plots	Chalk & Talk PPT, Jupyter					
29		**Simple Scatter Plots:** Scatter Plots with plt.plot, Scatter Plots with plt.scatter.	Chalk & Talk PPT, Jupyter					
30		plot Versus scatter: A Note on Efficiency	Chalk & Talk PPT, Jupyter					
31		**Visualization with Seaborn**: Seaborn Versus Matplotlib,	Chalk & Talk PPT, Jupyter					
32		Exploring Seaborn Plots, Histograms	Chalk & Talk PPT, Jupyter					
33		KDE and densities	Chalk & Talk PPT, Jupyter					
34		Pair plots, Faceted histograms.	Chalk & Talk PPT, Jupyter					
35		Factor plots, Bar plots, Example	Chalk & Talk PPT, Jupyter					

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MODULE 5 - Introduction to Machine Learning								
36		**Machine Learning:** What Is Machine Learning?, Categories of Machine Learning, Qualitative Examples of Machine Learning Applications, Regression: Predicting continuous labels,	Chalk & Talk PPT, Jupyter					
37		Clustering: Inferring labels on unlabeled data, Dimensionality reduction: Inferring structure of unlabeled data	Chalk & Talk PPT, Jupyter					
38		Introducing Scikit-Learn: Data Representation in Scikit-Learn.	Chalk & Talk PPT, Jupyter					
39		Scikit-Learn's Estimator API, Supervised learning example: Iris classification	Chalk & Talk PPT, Jupyter					
40		Unsupervised learning example: Iris dimensionality, Unsupervised learning:	Chalk & Talk PPT, Jupyter					
41		Iris clustering, Application: Exploring Hand-written Digits	Chalk & Talk PPT, Jupyter					
42		Hyperparameters and Model: Validation. Thinking about Model Validation, Model validation the wrong way, Model validation the right way: Holdout sets, Model validation via cross-validation	Chalk & Talk PPT, Jupyter					
43		Selecting the Best Model, Validation curves in Scikit-Learn	Chalk & Talk PPT, Jupyter					
44		Learning Curves, Learning curves in Scikit-Learn	Chalk & Talk PPT, Jupyter					
45		Validation in Practice: Grid Search	Chalk & Talk PPT, Jupyter					

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	Activity	Planned	Actual	Remarks
1	Theory Classes + Practical Classes	40L+0P		
2	Assignments/ Quizzes/ Self-study/Programs	2		
3	Tutorials/ Extra classes	3		
4	Internal Assessments	3		
5	ICT based Teaching (% of usage in Curriculum)	90%		

Planning	**Execution**
Faculty Signature:	**Faculty Signature:**
HoD Signature:	**HoD Signature:**