GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING SYLLABUS

Minor Degree : DATA SCIENCE

Subject Code : N117AT01

Subject Name : Analysing, Visualizing and Applying Data Science with Python

WEF Academic Year :	2026 - 27
Semester :	7
Category of the Course :	Compulsory

Course Objective :

- To learn how to use python for data science.
- To understand and use all the tools and libraries of python for data science.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	0	30	0	100

Course Content :

Sr. No.	Course Content	No. of Hours
1	**Module 1 :** Data Analysis libraries: will learn to use Pandas DataFrames, Numpy multi-dimentional arrays, and SciPy libraries to work with a various dataset.	6
2	**Module 2 :** Pandas, an open-source library, and we will use it to load, manipulate, analyze, and visualize various datasets.	8
3	**Module 3 :** Scikit-learn, and we will use some of its machine learning algorithms to build smart models and make predictions, various parameters that can be used to compare various parameters.	10
4	**Module 4 :** Descriptive Statistics, Basic of Grouping, ANOVA, Correlation, Polynomial Regression and Pipelines, R-squared and MSE for In-Sample Evaluation, Prediction and Decision Making.	10
5	**Module 5 :** Grid Search, Model Refinement, Binning, Indicator variables.	10
Total		**44**

References / Text Book :

1. Data Visualization with Python and JavaScript, Kyran Dale, Shroff Publisher/O'Reilly Publisher Publication.
2. Data Science Using Python and R by Chantal D. Larose and Daniel T. Larose, Wiley Publication.
3. Python for Data Science and Visualization -Beginners to Pro, Udemy.

Lab Work :

1. Demonstrate knowledge of Data Science and Machine Learning.
2. Apply Data Science process to a real life scenario.
3. Explore New York City - 311 Complaints and Housing datasets.
4. Analyze and Visualize data using Python.
5. Perform feature engineering exercise using Python.
6. Build and validate predictive machine learning model using Python.
7. Create and share Actionable Insights to real life data problems.

Course Outcome :

After Completion of the Course, Student will able to :

No.	Course Outcomes
01	To explain how data is can be collected from the Web.
02	To extract data and information from the webpages.
03	To make decision based on the data collected.

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