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| **Elective IV : Data Visualization (TH)** | |
| Total Credits: 03 | Subject Code: BTCT702T-3 |
| Teaching Scheme :  Lectures: 03 Hours/Week  Tutorials: 00 Hours/Week  Practical: 00 Hours/Week | Examination Scheme :  Duration of University Exam : 03 Hrs.  College Assessment : 30 Marks  University Assessment:70 Marks |

**Course Objectives:**

1. To learn different statistical methods for Data visualization.
2. To learn basics of R and Python.
3. To learn usage of Watson studio.
4. To learn about packages NumPy, pandas and matplotlib.
5. To learn functionalities and usages of Seaborn.

**Course Outcomes:**

On successful completion of the course, students will be able to:

1. Apply statistical methods for Data visualization.
2. Gain knowledge on R and Python
3. Understand usage of various packages in R and Python.
4. Demonstrate knowledge of Watson studio.
5. Apply data visualization tools on various data sets.

**UNIT I (10Hrs)**

Introduction to Statistics : Introduction to Statistics, Difference between inferential statistics and  
descriptive statistics, Inferential Statistics- Drawing Inferences from Data, Random Variables,  
Normal Probability Distribution, Sampling, Sample Statistics and Sampling Distributions.  
R overview and Installation- Overview and About R, R and R studio Installation, Descriptive Data  
analysis using R, Description of basic functions used to describe data in R.

**UNIT II (07 Hrs)**

Data manipulation with R: Data manipulation packages, Data visualization with R.  
Data visualization in Watson Studio: Adding data to data refinery, Visualization of Data on  
Watson Studio.

**UNIT III (05 Hrs)**

Python: Introduction to Python, How to Install, Introduction to Jupyter Notebook, Python scripting  
basics, NumPy and Pandas.

**UNIT IV (08 Hrs)**

Data Visualization Tools in Python- Introduction to Matplotlib, Basic plots using matplotlib,  
Specialized Visualization Tools using Matplotlib, Advanced Visualization Tools using Matplotlib-  
Waffle Charts, Word Clouds.

**UNIT V (06 Hrs)**

Introduction to Seaborn: Seaborn functionalities and usage, Spatial Visualizations and Analysis in Python with Folium, Case Study.

**Textbooks:**

1., R. Nageswara Rao, " Core Python Programming ", 2 nd Edition, Dreamtech Press.  
2. Alboukadel Kassambara ," R Graphics Essentials for Great Data Visualization" .

**References:**

1. Phuong Vo.T.H, Martin Czygan, Ashish Kumar, Kirthi Raman, "Python Data Analytics and Visualization.", A course in three modules, Packt Publishing 2017.