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.