DATA VISUALIZATION

Course Code	20CS6621	Year	III	Semester	II
Course Category	**Honors**	**Branch**	CSE	**Course Type**	Integrated
Credits	4	**L-T-P**	3-0-2	**Prerequisites**	-
Continuous Internal Evaluation :	30	**Semester End Evaluation:**	70	**Total Marks:**	100

	Course Outcomes	
Upon successful completion of the course, the student will be able to		
CO1	Understand fundamental concepts of Data visualization	**L2**
CO2	Apply different techniques and views for effective visualization of data	**L3**
CO3	Analyze the given data and use appropriate technique for better visualization	**L4**
CO4	Apply different visualization techniques for effective understanding of data	**L3**

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3													2
CO3		3							3	3				2
CO4	3													2

Syllabus		Mapped CO
Unit No.	**Contents**	
I	**Foundations for an Applied Science of data visualization:** Visualization Stages, Gibson's Affordance theory, A Model of Perceptual Processing, Costs and Benefits of Visualization. Types of Data: entities, relationships, attributes of entities or relationships, data dimensions, types of numbers, uncertainty, and operations considered as data.	**CO1**
II	**The Visualization Pipeline:** Conceptual Perspective, Implementation Perspective, Algorithm Classification **Scalar Visualization:** Color Mapping, Designing Effective Color maps, Contouring, Height Plots	**CO1,CO2,CO3**
III	**Vector Visualization:** Vector Glyphs, Vector Color Coding, Displacement Plots, Texture-Based Vector Visualization Domain- Modeling Techniques: Cutting, Selection, Grid Construction from Scattered Points	**CO1,CO2,CO3**
IV	**Image Visualization:** Image Data Representation, Image Processing and Visualization, Shape representation and analysis	**CO1,CO2,CO3**
V	**Information Visualization:** What Is Infovis, Table Visualization, Visualization of Relations, Multivariate Data Visualization, Text Visualization	**CO1,CO2,CO3**

Learning Resources
Text Books
1. Information Visualization Perception for Design, Colin Ware , 3rd edition, Morgan Kaufman 2012.   2. Data Visualization: Principles and Practice, Alexandru C. Telea, A. K. Peters Ltd, 2008   3. Core Python Programming , R. Nageswara Rao, Second Edition, Dreamtech Press
References
1. Data Points: Visualization that means something, Nathan Yau,Wiley, 2013.   2. The visual display of quantitative information, Edward R. Tufte, Second Edition, 2001, Graphics Press   3. Interactive Data Visualization for the Web, Scott Murray, 2013 , O'Reilly.
e-Resources & other digital material
1. https://help.tableau.com/current/pro/desktop/en-us/default.html   2. https://www.ibm.com/cloud/learn/data-visualization   3. https://www.oreilly.com/library/view/interactive-data-visualization/9781491921296/   4. http://web.cse.ohiostate.edu/~shen.94/5544/   5. https://www.coursera.org/learn/datavisualization

Experiments:

	Syllabus	
Exp. No.	**Contents**	**Mapped CO**
I	Generate a simple graph by using python matplotlib	**CO1,CO2,CO3, CO4,CO5**
II	Implement different types of plots available in python matplotlib	**CO1,CO2,CO3, CO4,CO5**
III	Develop multiple plots using subplot( ) function in matplotlib	**CO1,CO2,CO3, CO4,CO5**
IV	Demonstrate how to connect to various data sources in Tableau	**CO1,CO2,CO3, CO4,CO5**
V	Develop customized views by using Ask Data component in Tableau	**CO1,CO2,CO3, CO4,CO5**
VI	Build data views from scratch using Tableau	**CO1,CO2,CO3, CO4,CO5**

Learning Resources

Text Books

1	Data Visualization in Python, Daniel Nelson , StackAbuse
2	Data Visualization in Python with Pandas and Matplotlib, David Landup , StackAbuse
3	Information Dashboard Design by Stephen Few ,Second Edition, Analytics Press

References

1	The Data Loom by Stephen Few, Analytics Press

e-Resources & other digital material

1	https://matplotlib.org/2.0.2/
2	https://help.tableau.com/current/pro/desktop/en-us/default.html