

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

[illegible]

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