

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY

(Autonomous)

Kanuru, Vijayawada-520007

Department of Computer Science and Engineering (Data Science)

III B Tech – II Semester

DATA VISUALIZATION

Course Code	23DS3603	Year	III	Semester	II
Course Category	PCC	Branch	CSE (Data Science)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Python Programming
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes		
Upon Successful completion of course, the student will be able to		
CO1	Describe the fundamental concepts and principals of data visualization to understand visualization techniques effectively.	L2
CO2	Apply visualization reference models, mapping techniques, and analytics to design effective and meaningful data representations and applications.	L3
CO3	Use interaction and visualization techniques to represent and explore structured and unstructured data including text, trees, graphs, and networks.	L3
CO4	Analyze different visualization techniques to design an optimal system.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations													
(3: High, 2: Moderate, 1: Low)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2												
CO2	3												
CO3	3												
CO4		3									2		

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (Data Science)

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Syllabus

Unit No	Contents	Mapped CO
I	Introduction: What Is Visualization? History of Visualization, Relationship between Visualization and Other Fields. The Visualization Process. Data Foundations: Types of Data, Structure within and between the Data, Data Preprocessing	CO1
II	Creating Visual Representations: Visualization reference model, Visual mapping- The Eight Visual Variables, Effects of Visual Variables, Visual analytics- Types of Analytics, Design of Visualization applications- Steps in Designing Visualizations, Problems in Designing Effective Visualizations.	CO1, CO2, CO4
III	Classification of Visualization Systems: Interaction and visualization techniques misleading, Visualization of One-Dimensional data, Two-Dimensional data Text and Document Visualization: Single Document Visualizations, Document Collection Visualizations.	CO1, CO2, CO4
IV	Visualization Techniques for Trees, Graphs, and Networks: Displaying Hierarchical Structures (trees), Visualization of Graphs/Networks, Visualization of groups, clusters, software Visualization	CO1, CO3, CO4
V	Visualization of volumetric data: vector fields, processes and simulations, Visualization of maps, geographic information, GIS systems Comparing and Evaluating Visualization Techniques: User Tasks, User Characteristics, Data Characteristics, Visualization Characteristics Structures for Evaluating Visualizations.	CO1, CO3, CO4

Learning Resources

Text Books
<ol style="list-style-type: none"> Interactive Data Visualization: Foundations, Techniques, and Applications, Matthew O. Ward, Georges Grinstein, Daniel Keim, 1st Edition, 2010, A K Peters, Ltd. The Visual Display of Quantitative Information, Edward R. Tufte, 2nd Edition, 2001, Graphics Press.
E-References
<ol style="list-style-type: none"> The Visualization Handbook, Charles D. Hansen & Chris R. Johnson, 1st Edition, 2005, Elsevier Academic Press. Information Visualization: Perception for Design, Colin Ware, 4th edition, 2021, Morgan Kaufmann (Elsevier)
E-Recourses and other Digital Material
<ol style="list-style-type: none"> https://kdd.cs.ksu.edu/Courses/CIS536/Lectures/Slides/Lecture-34-Main_6up.pdf