

राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA

संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING अशोक राजपथ, पटना-८०००५, बिहार / ASHOK RAJPATH, PATNA-800005, BIHAR

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No:-	Date:

CS84132: Data Visualization Techniques

L-T-P-Cr: 2-0-2-3

Prerequisite – None Course Objectives:

- 1. To understand the basics of data visualization.
- 2. To Learn various techniques about visualizing the data.
- 3. To implement data visualization tools.
- 4. To learn about methods of visualizing distributions, associations among two or more quantitative variables and different types of data.

Course Outcomes:

After completion of the course, students will be able to:

- 1. Understand basic types of data and need of visualization.
- 2. Understand and analyse the visualization for data and distributions.
- 3. Identify and develop the different types of tools for visualizing the data.
- 4. Understand how to visualize the complex datasets.
- 5. Understand the different Image file formats.

Sl. No	Course Outcome (CO)	Mapping to PO		
1	Understand basic types of data and need of visualization.	PO1, PO2		
2	Understand and analyse the visualization for data and distributions.	PO1, PO8	PO2,	PO6,
3	Identify and develop the different types of tools for visualizing the data.	PO1, PO8	PO3,	PO6,
4	Understand how to visualize the complex datasets.	PO1, PO8	PO2,	PO6,
5	Understand the different Image file formats.	PO1, PO6		

UNIT 1 Lectures: 6

Introduction to Data, The Basic Data Types – Nominal, Ordinal, interval, Ratio scaled.

Non dependency Oriented Data: Quantitative Multidimensional Data, Categorical and Mixed Attribute Data, Binary and Set Data, Text Data.

Dependency-Oriented Data: Time-Series Data, Discrete Sequences and Strings, Spatial Data, Network and Graph Data.

Why visualize Data? The visualization pipeline.

UNIT-II Lectures:6

Visualizing Data: Mapping Data onto Aesthetics, Coordinate Systems and Axes, Colour scales, Directory of Visualizations, Visualizing Amounts.

UNIT-III Lectures:8

Visualizing Distributions and visualizing many Distributions at once, Visualizing Associations among Two or More Quantitative Variables, Visualizing Time series and other functions of an independent variable.

UNIT-IV Lectures:8

Visualize Trends, Geospatial data and uncertainty, Visualization of Networks and Trees, visualizing multidimensional data, Data Reduction – Reduce Items and Attributes.

UNIT-V Lectures:8

The principles of proportional link, Handling overlapping points, Balance the data and context, Understanding the most commonly used Image file formats, choosing the right visualization software.

Text Books:

- 1. Claus O. Wilke, Fundamentals of Data Visualization, O'Reilly publication, first Release Edition.
- 2. Tamara Munzner. Visualization Analysis and Design. A K Peters Visualization Series, CRC Press, 2014
- 3. Kieran Healy, Data Visualization: A Practical Introduction 1stEdition, Princeton university press.
- 4. Jiawei Han and Micheline Kamber, Data Mining- Concepts and Techniques-Morgan Kaufmann Publishers, Elsevier, 2nd Edition, 2006.