राष्ट्रीय प्रौद्योगिकी संस्थान पटना / NATIONAL INSTITUE OF TECHNOLOGY PATNA
संगणक विज्ञान एंव अभियांत्रिकी विभाग / DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
अशोक राजपथ, पटना-८००००५, बिहार / ASHOK RAJPATH, PATNA-800005, BIHAR
Phone No.: 0612-2372715, 2370419, 2370843, 2371929 Ext- 200, 202 Fax-0612-2670631 Website: www.nitp.ac.in

No:- **Date:**

CSX4227: Data Visualization

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, PO2, PO6, PO8
3	Identify and develop the different types of tools for visualizing the data.	PO1, PO3, PO6, PO8
4	Understand how to visualize the complex datasets.	PO1, PO2, PO6, PO8
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.