17IT2605B - DATA VISUALIZATION

Course Category:	Open Elective - IV	**Credits:**	3
Course Type:	Theory	**Lecture-Tutorial-Practice:**	3-0-0
Prerequisites:	17IT4604A - Big Data	**Continuous Evaluation:**	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes	Upon successful completion of the course, the student will be able to:	
	CO1	Illustrate visualizations that represent the relationships contained in complex data sets and their interpretation.
	CO2	Analyze and select appropriate data that can be used in order to create a visualization that answers a particular research application
	CO3	Identify the statistical analysis needed to validate the trends present in data visualizations.
	CO4	Choose leading open source software packages to create and publish visualizations that enable clear interpretations of big, complex and real world data.

Contribution of Course Outcomes towards achievement of Program Outcomes (L-Low, M-Medium, H- High)

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

Course Content

UNIT I:

The Context of Data Visualization : Visualization as a discovery tool, The bedrock of visualization knowledge, Defining data visualization, Visualization skills for the masses, The data visualization methodology.

Setting the Purpose and Identifying Key Factors: Establishing intent – the visualization's function, Establishing intent – the visualization's tone, Key factors surrounding a visualization project, The " eight hats" of data visualization design

UNIT II:

Conceiving and Reasoning Visualization Design Options: Data visualization design is all about choices, The visualization anatomy – data representation, The visualization anatomy – data presentation

Taxonomy of Data Visualization Methods: Data visualization methods, Choosing the appropriate chart type, Assessing hierarchies and part-to-whole relationships.

	UNIT III: **Constructing and Evaluating Your Design Solution:** For constructing visualizations, technology matters, The construction process, Approaching the finishing line, Post-launch evaluation, Case Studies on real-time applications.
	UNIT IV: **An Introduction to Connecting to Data:** An Introduction to Connecting to Data in Tableau, Shaping Data for Use with Tableau, Getting a Lay of the Land: Tableau Terminology, View the Underlying Data, View the Number of Records, Dimension Versus Measure, What Is a Measure? What Is a Dimension? Discrete Versus Continuous **Five Ways to Make a Bar Chart/An Introduction to Aggregation**: Five Ways to Create a Bar Chart in Tableau An Introduction to Aggregation in Tableau, Line Graphs, Independent Axes, and Date Hierarchies, How to Make a Line Graph in Tableau, Independent Axes in Tableau, Date Hierarchies in Tableau, Marks Cards, Encoding, and Level of Detail, An Explanation of Level of Detail, An Introduction to Encoding, Label and Tooltip Marks Cards, Case studies.
Text books and Reference books	**Text Book(s):** [1] Andy Kirk, "Data Visualization: a successful design process", Packt Publishing (26 December 2012) [2] Ryan Sleeper, Practical Tableau, O'Reilly Media, Inc.April2018. **Reference Books:** [1]. Chakrabarti, S,"Mining the web: Discovering knowledge from hypertext data ",Morgan Kaufman Publishers, 2003. [2]. Fry ,Vilisualizing data, Sebastopo,O'Reily, 2007.
E-resources and other digital material	[1]. Dr. Gaurav Dixit,Department of Management Studies, Indian Institute of Technology, Roorkee: https://nptel.ac.in/courses/110107092/7,2017 [2]. P Adam Marcus, and Eugene Wu. RES.6-009 How to Process, Analyze and Visualize Data. January IAP 2012. Massachusetts Institute of Technology: MIT Open Courseware, https://ocw.mit.edu.,2012 [3] Prof.Shankar Narasimhan,Ragunatha Rengasamy,IIT Madras , Data Visualization in R Basic graphics, 2016 https://nptel.ac.in/courses/106106179/11, [4] Dr. Ed Vul, Dr. Mike Frank, Massachusetts Institute of Technology, " Statistics and Visualization for Data Analysis and Inference", 2009. https://ocw.mit.edu/resources/res-9-0002-statistics-and-visualization-for-data- analysis-and-inference-january-iap-2009/,