

Branch Name:	Computer Engineering / Information Technology
Semester/Year:	Semester VI/ Third Year
Subject Title:	Data Handling & Visualization
Subject Code:	2ET1030605T
Pre-requisite:	Working knowledge of Programming Language, DBMS, JavaScript and HTML5

Course Objective:

1. To understand working of internet and websites.
2. To study programming for web application development.
3. To analyze and design web user interface with browser compatibility.
4. To understand working of data connectivity on server side programming.

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Sr. No	Topic	Total Hours	Weightage (%)
1	Introduction to Data Visualization: Acquiring and Visualizing Data, Simultaneous acquisition and visualization, Applications of Data Visualization, Keys factors of Data Visualization (Control of Presentation, Faster and Better JavaScript processing, Rise of HTML5, Lowering the implementation Bar) Exploring the Visual Data Spectrum: charting Primitives (Data Points, Line Charts, Bar Charts, Pie Charts, Area Charts), Exploring advanced Visualizations (Candlestick Charts, Bubble Charts, Surface Charts, Map Charts, Infographics). Making use of HTML5 CANVAS, Integrating SVG	04	15
2	Basics of Data Visualization – Tables: Reading Data from Standard text files (.txt, .csv, XML), Displaying JSON content Outputting Basic Table Data (Building a table, Using Semantic Table, Configuring the columns), Assuring Maximum readability (Styling your table, Increasing readability, Adding dynamic Highlighting), Including computations, Using data tables library, relating data table to a chart	06	20
3	Visualizing data Programmatically: Creating HTML5 CANVAS Charts (HTML5 Canvas basics, Linear interpolations, A Simple Column Chart, Animations), Starting with Google charts (Google Charts API Basics, A Basic bar chart, A basic Pie chart, Working with Chart Animations).	06	20
4	Introduction to D3.js: Getting setup with D3, Making selections, changing selection's attribute, D3 strives to be declarative, Changing methods, appending new elements,	04	15

	Putting all together, Loading and filtering External data : Building a graphic that uses all of the population distribution data, Data formats you can use with D3, Creating a server to upload your data, D3's function for loading data,		
5	Advanced Data Visualization: Making charts interactive and Animated: Data joins, updates and exits, interactive buttons, Updating charts, Adding transactions, using keys Adding a Play Button: wrapping the update phase in a function, Adding a Play button to the page, Making the Play button go, Allow the user to interrupt the play, sequence	05	15
6	Information Dashboard Design: Introduction, Dashboard design issues and assessment of needs, Considerations for designing dashboard-visual perception, Achieving eloquence, Advantages of Graphics _Library of Graphs, Designing Bullet Graphs, Designing Spark lines, Dashboard Display Media, Critical Design Practices, Putting it all together - Unveiling the dashboard.	05	15

List of Reference Books:

1. Jon Raasch, Graham Murray, Vadim Ogievetsky, Joseph Lowery, "JavaScript and jQuery for Analysis and Visualization", WROX
2. Ritchie S. King, Visual story telling with D3" Pearson
3. Ben Fry, "Visualizing data: Exploring and explaining data with the processing environment", O'Reilly, 2008.
4. A Julie Steele and Noah Iliinsky, Designing Data Visualizations: Representing Informational Relationships, O'Reilly
5. Andy Kirk, Data Visualization: A Successful Design Process, PAKT
6. Scott Murray, Interactive Data Visualization for Web, O'Reilly
7. Tamara Munzner, Visualization Analysis and Design, AK Peters Visualization Series, CRC Press, Nov. 2014

E-Resources / Web Links

1. <http://nptel.ac.in/courses/106105084/>
2. <https://technicalsagar.in/web-technology/>
3. <https://www.w3schools.com>
4. <https://www.geeksforgeeks.org/web-technology/>
5. <https://D3js.org>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO 1	Explore various data visualization techniques in order to provide new insight.	2 Understanding
CLO 2	Apply appropriate data visualization techniques to provide trends/insights for the given dataset.	2 Understanding
CLO 3	Apply visualization tools / techniques for various data analysis tasks.	3 Applying
CLO 4	Given the application context for given data set, Design the information Dashboard for access information based on user criteria.	6 Creating
CLO 5	Upgrading skill set according to latest market needs and use web testing tools.	2 Understanding

Mapping of CLO with PO and PSO

Course Learning Outcome	Program Outcomes (POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO 1	H	H	H		H							M	M	M
CLO 2	H	M	H		L							M	M	M
CLO 3						H		M					H	
CLO 4	M	H	M	M		M	L	M						M
CLO 5	H	H	H	M	H							M	L	M

H: High, M: Medium, L: Low