

Branch Name:	Bachelor of Science (Information Technology)
Program Code:	ET110
Semester/Year:	Semester - V/ Third Year
Subject Title:	Data Modelling & Visualization
Subject Code:	1ET1100504
Pre-requisite:	Basics of Programming, Data Analysis

Course Objective:

- The graphical depiction of data is known as data visualization, and it is used to effectively and dynamically communicate insights to clients, customers, and stakeholders in general.
- It is a means to condense your findings and present them in a way that makes them easier to read and can be used to spot patterns or trends.
- This course will teach you how to design engaging charts and visuals that will appeal to your audience while also increasing their usefulness.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	01	02	05	70	30	30	20	150

Subject Contents

Sr. No	Topic	Total Hours	Weight (%)
1	Data-Analytic Thinking Knowing your data, Data preprocessing, Storytelling with data	7	20
2	Data Visualization using R Introduction to R programming, Visualization using R, Transformation using R, Exploratory data analysis	8	25
3	Data Modeling Linear regression, Logistic regression, K-nearest neighbors, K-means clustering	7	20
4	Data Visualization using Tableau Introduction to Tableau, data import and management, data type and operations, Different types of data visualizations, dashboards, storytelling	8	15

5	Data Modeling from Different Data Sources for Visualization Understanding structured, unstructured and semi-structured data sources, Data modeling and creating visualization charts/dashboards from structured data like databases (SQL and NoSQL)	10	20
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List of Reference Books:

1. Storytelling with Data: A Data Visualization Guide for Business Professionals. by Cole Nussbaumer Knaflic. Released November 2015. Publisher(s): Wiley.
2. Communicating Data with Tableau by Ben Jones, O'Reilly Media, Inc 2014.
3. Beautiful Visualization: Looking at Data through the Eyes of Experts (Theory in Practice) by Julie Steele, O'Reilly Media, Inc 2010.
4. Practical Tableau by Ryan Sleeper, O'Reilly Media, Inc 2018.
5. Data Visualization with Python and JavaScript by Kyran Dale, O'Reilly Media, Inc Kevin Night, Elaine Rich, and Nair B., "Artificial Intelligence", McGraw Hill, 2017
6. Graph Data Modeling for NoSQL and SQL: Visualize Structure and Meaning Thomas Frisendal Technics Publications, 2016.

List of Suggested titles of Experiments:

1. Loading and Distinguishing Dependent and Independent parameters
2. Exploring Data Visualization tools
3. Drawing Charts
4. Drawing Graphs
5. Data mapping
6. Creating Scatter Plot maps
7. Using BNF Notations
8. Working with REGEX
9. Visualize Network Data
10. Understanding Data Visualization frameworks

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

CLO	Description	Bloom's Taxonomy Level
CLO1	Manipulate large datasets and handle missing or inconsistent values in datasets	3 Applying 4 Analyzing
CLO2	Perform statistical analysis using packages such as Numpy and Scipy.	5 Evaluating
CLO3	Analyze and visualize datasets using packages such as seaborn and matplotlib.	4 Analyzing 2 Understanding
CLO4	Develop interactive visualization using packages such as Plotly and Shiny.	3 Applying
CLO5	Recognize and reduce data and spatial biases	2 Understanding

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	M	L	L	M								M	M		
CLO2	M	M	M	L	M								M	M		
CLO3	M	M	M	M	H								M	M		
CLO4	M	L	M	L	M								M	M		
CLO5	M	M	M	H	M								M	M		

H: High, M: Medium, L: Low