

Branch Name:	Artificial Intelligence & Data Science
Program Code	ET108
Semester/Year:	Semester V/ Third Year
Course Name:	Data Visualization and Modelling
Course Code:	2ET1080501T
Pre-requisite:	Working knowledge of Programming Language, DBMS, JavaScript and HTML

Course Objectives:

1. 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.
2. It is a means to condense your findings and present them in away that makes them easier to read and can be used to spot pattern sort rends.
3. 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:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (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

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Introduction to Data Visualization Tools Python Libraries for Visualization, Power BI, Tableau	7	20
2	Data Visualization Tools in Python Introduction to Mat plot lib, Basic Plotting with Mat plot lib, Line Plots, Area Plots, Histograms, Bar Charts, Pie Charts, Box Plots Scatter Plots, Bubble Plots	8	20
3	Advanced Visualization Tools Waffle Charts, Word Clouds, Introduction to Sea born: Sea born functionalities and usage, Spatial Visualizations and Analysis in Python with Folium, Case Study.	7	15
4	Tableau initialization Tableau installation, Data source settings in tableau, Data Interpreter, Interface of Tableau sheet, Various menu options	8	15
5	Tableau Visualization Visualization using Tableau, Various graphs in tableau, Real world data visualization tasks	10	20

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 Sparklines, Dashboard Display Media, Critical Design Practices, putting it all together - Unveiling the dashboard.	5	10
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List of Reference Books:

1. Core Python Programming - Second Edition, R. Nageswara Rao, Dreamtech Press., 1 January 2018
2. Communicating Data with Tableau by Ben Jones, O'Reilly Media, Inc., June 2014
3. Beautiful Visualization: Looking at Data through the Eyes of Experts (Theory in Practice) by Julie Steele, O'Reilly Media, Inc., June 2010.
4. Practical Tableau by Ryan Sleeper, O'Reilly Media, Inc., April 2018
5. Data Visualization with Python and JavaScript by Kyran Dale, O'Reilly Media, Inc, December 2022

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

CLO	Description	Bloom's Taxonomy Level
CLO1	Use the concepts and techniques of discrete mathematics for theoretical computer science.	3 Applying 4 Analyzing
CLO2	Identify different formal languages and their relationship.	5 Evaluating
CLO3	Classify and construct grammars for different languages and vice-versa.	4 Analyzing 2 Understanding
CLO4	Build finite automata, push down automata and turing machine.	3 Applying
CLO5	Analyze various concepts of undecidability and Computable Function and Discuss analytically and intuitively for problem-solving situation.	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	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	H	M	L		H	M			M	L	M		H	M	L	L
CLO2	M	H	M	L	M	H		L	H	M	L		M	M	M	M
CLO3	L	H	M	H	L	H	H		M	H	L	L	H	M	H	L
CLO4	M	L	M	H	M	L		H	L	M			H	M		
CLO5	M	H	L	M	H		L		H		M		M	L		

H: High, M: Medium, L: Low