



SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.D.T., Narsapur -534280, (Andhra Pradesh)

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Course Code	Course Title	Semester/Regulation	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
23CD6T03	DATA VISUALIZATION	VI	AI&ML	5	2025-26	

COURSE OUTCOMES		KNOWLEDGE LEVELS
1	Understand the basics and importance of data visualization and visual perception.	K2
2	Learn to create visual representations using visual mapping and analytics.	K1, K2
3	Explore techniques to visualize 1D, 2D, multi-dimensional, and text data.	K4
4	Visualize complex data like trees, graphs, clusters, and networks.	K4
5	Understand advanced visualizations for maps, simulations, and recent trends.	K2, K4

UNIT-I: INTRODUCTION TO DATA VISUALIZATIONS

UNIT	Outcomes / Bloom's Level	Topics No.	Topics/Activity	Text Book/Reference	Contact Hour	Delivery Method
I	CO1: Understand the basics and importance of data visualization and visual perception.	1.1	Introduction to Data Visualization	T1	1	Chalk & Board PPT
		1.2	History of Visualization	T1	1	
		1.3	Relationship between Visualization and Other Fields	T1	1	
		1.4	The Visualization Process	T1	1	
		1.5	Introduction of visual perception	T1	1	
		1.6	Gestalt principles	T1	1	
		1.7	visual representation of data	T1	1	
		1.8	Information overload	T1	1	
	CBS	1.9	Ethical considerations in visual communication	R2	1	
Total					09	

UNIT-II: VISUAL REPRESENTATIONS

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book/Reference	Contact Hour	Delivery Method
I	CO2: Learn to create	2.1	Creating visual representations	T1	2	Chalk

visual representations using visual mapping and analytics.	2.2	visualization reference model,	T1	1
	2.3	visual mapping	T1	2
	2.4	visual analytics	T1	1
	2.5	Design of visualization applications	T1	1
CBS	2.6	3D visualization techniques for scientific data	R2	1

Total 09

UNIT-III: CLASSIFICATION OF VISUALIZATION SYSTEMS-I

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
II	CO3: Explore techniques to visualize 1D, 2D, multi-dimensional, and text data.	3.1	Classification of visualization systems	T1	2	Chalk & Board PPT
		3.2	Interaction and visualization techniques misleading	T1	2	
		3.3	Visualization of one, two and multi-dimensional data	T1	2	
		3.4	Text and Text documents.	T1	2	
	CBS	3.5	Data dashboards and real-time visualization systems	T1	2	

Total 10

UNIT-IV: CLASSIFICATION OF VISUALIZATION SYSTEMS-II

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
III	CO4: Visualize complex data like trees, graphs, clusters, and networks.	4.1	Visualization of groups	T1	2	Chalk & Board PPT
		4.2	Visualization of trees	T1	1	
		4.3	Visualization of graphs	T1	2	
		4.4	Visualization of clusters	T1	1	
		4.5	Visualization of networks	T1	1	
		4.6	Visualization of software	T1	1	
	4.7	Metaphorical visualization	T1	1		
CBS	4.8	Radial and circular visualization techniques	R1	1		

Total 10

UNIT-V: CLASSIFICATION OF VISUALIZATION SYSTEMS-III, RECENT TRENDS

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
IV	CO5: Understand advanced visualizations for maps, simulations, and recent trends.	5.1	Visualization of volumetric data	T1	1	Chalk & Board PPT
		5.2	Vector fields	T1	1	
		5.3	processes and simulations	T1	1	
		5.4	Visualization of maps	T1	1	
		5.5	Visualization of geographic information	T1	1	

CBS	5.6	Visualization of GIS systems	T1	1
	5.7	collaborative visualizations	T1	1
	5.8	Evaluating visualizations	T1	1
	5.9	Recent trends in various perception techniques,	T1	1
	5.10	Various visualization techniques	T1	1
	5.11	Data structures used in data visualization.	T1	1
	5.12	AI and machine learning in automated visualizations	R1	1
Total				12
CUMULATIVE PROPOSED PERIODS				50

Text Books:



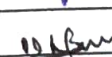


S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	WARD, GRINSTEIN, KEIM,. Interactive Data Visualization: Foundations, Techniques, and Applications. Natick:AKPeters, Ltd, 2015
T2	E.Tufte, The Visual Display of Quantitative Information, GraphicsPress, 2014

Reference Books:

S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
R1	Beautiful Visualization, Looking at Data Through the Eyes of Experts by Julie Steele, Noah Iliinsky, 2010
R2	The Accidental Analyst: Show Your Data Who's Boss by Eileen and Stephen McDaniel, 2012

Web Details:

1	https://www.geeksforgeeks.org/data-visualization-and-its-importance/
2	https://www.javatpoint.com/what-is-data-visualization
3	https://www.kaggle.com/learn/data-visualization
4	https://nptel.ac.in/courses/111106415
5	https://elearn.nptel.ac.in/shop/iit-workshops/completed/data-visualization-with-r/

	Name	Signature
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