Course Code	18CSE490T	Course Name	BIG DATA VISUALIZATION	Course Category	E	Professional Elective	L	T	P	C
							3	0	0	3

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Science and Engineering	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning			Program Learning Outcomes (PLO)														
CLR-1 :	*Understand the key techniques used in visualization which includes data models, graphical perception and techniques specifically for visual encoding and interaction*	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	*Obtain an exposure to common data domains and the corresponding analysis tasks which includes multivariate data and text*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLR-3 :	*Get hands-on experience in building and evaluating visualization systems*																		
CLR-4 :	*Gain knowledge in data visualization aides*																		
CLR-5 :	*Understand the significance of data by placing it in a visual context*																		
CLR-6 :	*Utilize the knowledge by reading and discussing research papers from the visualization literature*																		
Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*																		
CLO-1 :	*Design and exploring the result with data visualizations*	*3*	*75*	*70*	*L*	*M*	*M*	*M*	*L*	-	-	-	*M*	*L*	*M*	*M*			
CLO-2 :	*Conducting exploratory data analysis using visualization techniques and tools.*	*3*	*75*	*70*	*M*	*H*	*M*	*M*	*M*	-	-	-	*M*	*L*	*M*	*M*			
CLO-3 :	*Visual presentations of data for effective Communication.*	*3*	*80*	*75*	*M*	*M*	*H*	*H*	*M*	*M*	-	-	*M*	*M*	*H*	*H*			
CLO-4 :	*Designing and evaluating color palettes for visualization based on principles of perception.*	*3*	*85*	*80*	*M*	*M*	*M*	*H*	*H*	-	-	-	*M*	*M*	*H*	*H*			
CLO-5 :	*Using the knowledge of perception and cognition to evaluate visualization design alternatives*	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*H*	-	-	-	*M*	*M*	*H*	*H*			
CLO-6 :	*Identifying opportunities for the application of data visualization in various domains.*	*3*	*85*	*80*	*M*	*H*	*H*	*H*	*H*	-	-	-	*M*	*M*	*H*	*H*			

Duration (hour)		9	9	9	9	9
S-1	SLO-1	*Introduction to Big Data Visualization*	*Definitions and explanations of visualization categories*	*An Introduction to Visualization tools*	*Introduction to D3*	*Case Studies: 1: Color considerations with a dark background*
	SLO-2	*Challenges of Big Data Visualization*	*Exploring R In big data*	*Visualization tools and big data*	*D3 and big data*	
S-2	SLO-1	*Categorization*	*Example with Patient Medical History*	*Example 1 – Sales transactions*	*Basic Examples*	*2: Leveraging animation in thevisuals you present*
	SLO-2	*Visualization Philosophies*	*Digging in with R*	*Adding more context*	*Getting started with D3*	
S-3	SLO-1	*Approaches to Big Data Visualization*	*No looping*	*Wrangling the data*	*D3 visualization sample templates*	*3: Logic in order*
	SLO-2	*Quality of Visualization*	*Comparisons and Contrasts*	*Trifacta Script panel*	*Big data visualization using D3*	
S-4	SLO-1	*Infographics versus Data Visualization*	*Tendencies*	*A visualization dashboard*	*Displaying Results Using D3*	*4: Strategies for avoiding thespaghetti graph*
	SLO-2	*Exploration versus Explanation*	*Dispersion*	*Experimenting with the data and build the visualization*	*Create a summary file for visualization*	
S-5	SLO-1	*Informative versus Persuasive versus Visual Art*	*Data quality categorized*	*Data pane_core details*	*Visualization using HTML document*	*5: Alternatives to pies*
	SLO-2	*Ingredients of Successful Visualizations*	*Data Manager*	*Constructing Dashboards*	*Data visualization showing the stacked view*	
S-6	SLO-1	*Choose Appropriate Visual Encodings-Natural Ordering, Distinct Values*	*Data Manager and big data*	*Saving and Presenting the work*	*Visual transitions*	*Final Thought*
	SLO-2	*Redundant Encoding ,Defaults versus Innovative Formats ,Readers' Context*	*Example-Reformatting-A little Setup*	*Visualization re-coloring, resizing, adding or changing labels*		
S-7	SLO-1	*Compatibility with Reality ,Patterns and Consistency*	*Adding Script Code*	*Filters and Measure Names*	*Multiple donuts*	*Where to go from here*
	SLO-2	*Selecting Structure*	*Executing the scene*	*Example-Promotion Spend Effect on Sales*	*Another twist on bar chart visualizations with examples*	
S-8	SLO-1	*Position: Layout and Axes*	*Status and relevance*	*Sales and spend*		*Building storytelling with data*

	SLO-2	*The Meaning of Placement and Proximity*	*Naming the nodes*	*Sales v Spend and Spend as % of Sales Trend*	*D3 Stacked Area via Nest template*	*competency in yourteam or organization*
S-9	SLO-1	*Patterns of Organization-Specific Graphs, Layouts, and Axis Styles*	*Consistency ,Reliability ,Appropriateness*	*ables and indicators*	*Adopting the sample*	
	SLO-2	*Appropriate Use of Circles and Circular Layouts*	*Accessibility and Other Output nodes*		*Visualization changes format*	

Learning Resources	1. *Big Data Visualization,James D. Miller,Copyright © 2017 Packt Publishing* 2. *Designing Data Visualizations,by Noah Iliinsky and Julie Steele,Copyright © 2011 Julie Steele and Noah Iliinsky. All rights reserved.Printed in the United States of America*	3. *Storytelling with data - a data visualization guide for business professionals by cole nussbaumer knaflic, Wiley publications* 4. *Tableau Your Data! by Daniel G. Murray and the InterWorks BI Team, Wiley publications*

Learning Assessment

	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	*40%*	-	*30%*	-	*30%*	-	*30%*	-	*30%*	-
	Understand										
Level 2	Apply	*40%*	-	*40%*	-	*40%*	-	*40%*	-	*40%*	-
	Analyze										
Level 3	Evaluate	*20%*	-	*30%*	-	*30%*	-	*30%*	-	*30%*	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers

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