SEMESTER – II

Course Code	PAD21201J	Course Name	DATA VISUALIZATION AND CONCEPTS	Course Category	C	*Professional Core*	L	T	P	C
							3	0	4	5

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*Describe real time data dashboards with Tableau*
CLR-2 :	*Discover the data visualization concepts*
CLR-3 :	*Illustrate data elaboration*
CLR-4 :	*Creating real time data dash boards*
CLR-5 :	*Introducing, installing and configuring Data visualization with Seaborn*
CLR-6 :	*Explore Data visualization with Matplotlib, Bokeh,Pygal*

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*To gather knowledge on Data visualization principles*	*3*	*80*	*70*	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*-*	*L*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-2 :	*To understand and implement data visualization concepts*	*3*	*85*	*75*	*M*	*H*	*L*	*M*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-3 :	*To understand and implement data visualization using graphs.*	*3*	*75*	*70*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-4 :	*To understand data dashboards*	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-5 :	*To understand and apply data visualization tools*	*3*	*85*	*75*	*H*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-6 :	*To implement open source data visualization tool*	*3*	*80*	*70*	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*-*	*L*	*L*	*-*	*H*	*-*	*-*	*-*

Duration (hour)		21	21	21	21	21
S-1	SLO-1	*Introduction to Tableau Tableau story*	*Data Visualization Concepts*	*Data Dashboards using Tableau*	*Open Source Data Visualization with Seaborn*	*Open Source Data Visualization with Matplotlib, Bokeh And Pygal*
	SLO-2	*Tableau Application suite*	*Storytelling process*	*Real time dashboard and Tableau for real time dashboard*	*Introduction to Seaborn and install Seaborn*	*An Introduction To Matplotlib*
S-2	SLO-1	*Data Preparation*	*interpreting context*	*Real time data for Tableau*	*Statistical data visualization*	*analysing Data Using NumPy*
	SLO-2	*Adding data sources in Tableau The sample dataset*	*Program for slicing substrings and analysis types*	*Real time dashboard updates*	*Simple Univariate distributions configure univariate*	*analysing Data Using Pandas*
S-3	SLO-1	*The Tableau Workspace*	*Program using substring*	Dashboard pane	*Seaborn Univariate plots*	*Visualizing data , Univariate distributions*

	SLO-2	*Working with measures and dimensions*	*storytelling*	*Visualizing dashboard updates with Tableau*	*distribution plots*	*Bivariate distributions and summary statistics*
S4 - S7	SLO-1 SLO-2	Lab 1: *Installing Tableau Desktop*	Lab 4:Visualize a story	Lab 7: *Creating a new dashboard*	Lab 10: *explore different types of Bivariate distributions*	Lab 13: *summary statistics using native*
S-8	SLO-1	*Working with marks*	*storytelling -who*	*Tableau Dashboard*	*Simple Bivariate distributions*	*Python functions*
	SLO-2	*Data extracts*	*storytelling - what* *storytelling –how*	*Organizing Tableau Dashboard*	*analyse multiple variable pairs*	*Correlation ,Covariance, Z-score*
S-9	SLO-1	*Editing model's metadata , Data types*	*Visualization for storytelling*	*Organizing Tableau Dashboard*	*Regression plots*	*Summary Statistics using NumPy, SciPy*
	SLO-2	*Working with measures*	*storytelling scenarios*	*Formatting Tableau dashboard*	*Themes. styles in seaborn*	*relevance of data visualization for business*
S-10	SLO-1	*Working with dimensions*	*bar charts, types of bar charts*	Dashboard Actions	*searching for patterns in a dataset*	*libraries for data visualization in python*
	SLO-2	*Adding Hierarchies*	*slope graphs*	Dashboard Titles	*Graphs in Seaborn , Types of Graphs*	*Python data visualization environment*
S11 - S-14	SLO-1 SLO-2	*Lab 2: Working with sample dataset in a Tableau Workspace*	*Lab 5 : Graphical tools for data elaboration*	*Lab 8 : Working with Dashboard*	*Lab 11 : Analyse Bivariate Distribution and multiple variable pairs*	Lab 14: *plot graphs*
S 15	SLO-1	*Calculated Fields, Table Calculations*	*storyboarding*	*Data driven decisions - Data driven decisions with Dashboard*	*configuring plot aesthetics normal distribution and outliers*	*using histograms - matplotlib*
	SLO-2	*Data Collection , Checklist for Data Collection*	*Visual selection*	*Interactive Tableau Dashboard* *Embedding Tableau workbook*	*distributions within categories-part*	*matplotlib libraries for visualization*
S-16	SLO-1	*Creating workbook*	*clutter and clutter elimination* *Gestalt principle*	*Tableau dashboard starters* *Tableau dashboard extensions*	*analysing categories with facet grids*	*bar chart using ggplot* *bokeh and pygal*
	SLO-2	*Saving Workbook*	*story design best practices and tools for storytelling*	*Tableau dashboards and story points*	*analysing categories with facet grids-part Figure plots , Reducing*	*select visualization libraries interactive graphs and image files*
S-17	SLO-1	*Sharing workbook*	*Decluttering , Declutter data visualizations*	*Templates for cloud data sharing your Tableau dashboard*	*introducing colour palettes*	*using scatter plots ,graphs ,barcharts , using box and whisker plots*
	SLO-2	*Data tables, Selecting Data Tables*	*Dashboard storytelling*	Charts. Tableau maps and Placing charts on dashboard	*Choosing colour palettes* *Color guide*	*using a bubble plot ,chart types, stacked bar plot - animate plots with matplotlib*
S-18 - S-21	SLO-1 SLO-2	*Lab 3: Working with Data Tables*	*Lab 6: Create a story with Tableau*	Lab 9: *building a real time dashboard*	Lab 12: *using colour palettes.*	Lab 15: *plotting in Jupyter notebook*

Learning Resources	*Fundamentals of Data Visualization, By Claus O. Wilke, April 2019* *Visual Analytics with Tableau, By Alexander Loth, May 2019*	*Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software, By Daniel G. Murray, November 2013* *Hands-On Data Visualization with Bokeh, By Kevin Jolly, June 2018*

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

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

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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