PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada-520010
Re-accredited at 'A+'by the NAAC

Offered to: M.Sc. (Computational Data Science)

CourseName	Data Visualization		**L**	**T**	**P**	**C**	**CIA**	**SEE**	**TM**
CourseCode	22DS4E3		4	0	0	4	30	70	100
Year of Introduction: 2021	**Year of Offering:** 2023	**Year of Revision**: 2023			**Percentage of Revision:** NA				
L-Lecture, T-Tutorial, **P**-Practical, **C**-Credits, **CIA**-Internal Marks, **SEE**-External Marks, **TM**-Total Marks									

Course Descriptive and Purpose: This course provides students with a comprehensive understanding of the principles, techniques, and applications of visualizing data. In an era where data is abundant but understanding it is critical, this course explores the art and science of creating meaningful visual representations. Students will gain hands-on experience with various tools and techniques to communicate complex information effectively through compelling visualizations.

Course Objectives: This course is designed to Develop proficiency in creating compelling visualizations, understanding the nuances of design, and appreciating the impact of visual communication in the data science and business realms.

Course Outcomes:
On successful completion of this course, the students able to:
CO1: How to create and open Workbooks, Connect various Data Sources, Make use of Measures & Dimensions, Interact with Users, Work with Data.
CO2: Demonstrate Basic Visualization Design, Power BI Data Munging (Query)
CO3: Analyze Power Pivot Model, Uni-variate/Bi-Variate& Multi-variate Charts
CO4: Explain Power BI Environment
CO5: Create Tableau Maps, Creating Dashboards and Stories.

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
22DS4E3	**CO1**	**M**	**M**					
	CO2			**M**		**M**		
	CO3	**M**				**M**		**L**
	CO4			**M**		**M**		
	CO5		**M**				**M**	**L**

UNIT-I (12 Hours)

Introduction to Tableau: What is Tableau? - Opening Existing Workbooks - Creating New Workbooks - Tableau.
Basic Visualization Design: Using Show Me - Choosing Mark Types - Color - Size - Shape and Label Options- Choosing Color Options - Setting Mark Size - Choosing Shapes - Text Tables and

Mark Labels - Formatting Options - Evaluating Multiple Measures - Shared Axis Charts - Measure Names and Measure Values - Dual Axis Charts.

Connecting to Data: Connecting to Various Data Sources - The Data Source Page - Customizing Your View of the Data: Changing Data Type - Modifying Dimension / Measure Assignment - Hiding -Renaming and Combining Fields - Splitting Fields - Changing the Default Field Appearance - Organizing Dimensions in Hierarchies Using Table or Folder View - Saving and Sharing Metadata Extracting Data -Data Blending - Moving from Test to Production Database.

UNIT-II (12 Hours)

Top 10 Chart Types (Uni-variate/Bi-Variate& Multi-variate Charts): Bar Chart - Line/Area Chart - Pie Chart - Text Table / Crosstab - Scatter Plot - Bubble Chart - Bullet Graph - Box Plot - Tree Map - Word Cloud.

Interacting with the Viewer: Filtering Data - Include or Exclude from the Worksheet - Basic Filtering -Quick Filters - Parameters - Creating a Parameter - Displaying a Parameter - Using a Parameter in a Worksheet - Worksheet Actions - Filter Actions - Highlight Actions - URL Actions.

UNIT-III (12 Hours)

Tableau Maps: Geocoded Fields - Geographic Hierarchies and Ambiguity - Custom Geocoding - Background Maps and Layers - Navigating Maps and Selecting Marks - Map Options - Web Map Services - Mapping and Mark Types - Custom Background Images - Generating Your Own Coordinate System - Adding a Custom Background Image.

Creating Dashboards and Stories: Creating a Simple Dashboard - Setting Dashboard - Size - Adding Sheets - Associated Worksheet Elements - Supplementary Dashboard Features - Layout Container - Blank Text - Image - Webpage - Setting Dashboard and Element - Sizes - Dashboard Actions - Highlight Action - Filter Action - URL Action.

UNIT-IV (12 Hours)

Introduction Power Pivot:

Introduction of Pivot: Use Power Pivot - xVelocity in Memory Analytics Engine - Exploring the Data Model Management Interface - Analyzing Data Using a Pivot Table.

Data Operations:

Working with Data: Import Data from Relational Databases - Import Data from Text Files - Import Data from a Data Feed - Import data from an OLAP cube.

Power BI Data Munging (Query): Discover and import data from various Sources - Getting, Cleaning and Shaping Data - Creating Table Relationships, Data, Merge, Shape, and Filter Data - Group and Aggregate Data - Insert Calculated Columns.

UNIT-V (12 Hours)

Power Pivot Model: Creating Data Model - Explain what a Data Model is, Create Relationships between Tables in the Model, Create and use a Star Schema - Understand when and how to de-normalize the Data, Create and use Linked Tables.

Power BI:

Power BI Environment: Adding Calculations and Measures - Importing Graphs - User Graphs, Dash boards- Incorporating Time Based Analysis.

Prescribed Text Books			
	Author	Title	Publisher
1	George Peck	Tableau 9 - The Official Guide	McGraw Hill, 2016
2	Dan Clark	Beginning Power BI: A Practical Guide to Self Service Data Analytics with Excel 2016 and Power BI Desktop	O'Reilley, Second Edition, 2017 ISBN: 1484225767

Reference Text Books			
	Author	Title	Publisher
1	Ashutosh Nandeshwar	Tableau Data Visualization Cookbook	Packt Publishing Ltd, 2013
2	Rob Collie &Avi	Power Pivot and Power BI:	Holy Macro!

	Singh	The Excel User's Guide to DAX Power Query, Power BI & Power Pivot in Excel 2010-2016	Books, 2016
3	Daniel G. Murray	Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software Second Edition	Second Edition, John Wiley & Sons, 2016 ISBN: 978-1-119-00119-5

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M.Sc.(Computational Data Science) **Semester :IV**

Course Code: 22DS4E3Course Name: Data Visualization

Time: 3 Hours **Max. Marks: 70**

SECTION-A

Answer the following questions. (5×4=20Marks)

1. (a) What is Tableau? (CO1,L1)

(or)

(b) How do you change Data Type in Tableau. (CO1,L1)

2. (a) What is *Tree Map*? (CO6,L1)

(or)

(b) What is *Quick Filter*? (CO6,L1)

3. (a) Name any two *Web Map Services*. (CO6,L1)

(or)

(b) Name any two features of Supplementary Dashboard. (CO6,L1)

4. (a) What is Pivot Table? (CO2,L1)

(or)

(b) What is Data Munging? (CO2,L1)

5. (a) What is Star Schema? (CO5,L1)

(or)

(b) What are the advantages of Time Based Analysis? (CO4,L1)

SECTION-B

Answer the following questions. (5×10=50Marks)

6. (a) Explain Shape and Label Options and Formatting Options in Tableau. (CO2,L2)

(or)

(b) Illustrate how data sources connected to Tableau. (CO1,L2)

7. (a) Demonstrate Uni-variate charts. (CO4,L2)

(or)

(b) Demonstrate Basic Filters and Quick Filters. (CO6,L2)

8. (a) Compare any two types of Tableau Maps. (CO6,L4)

(or)

(b) Examine the procedure to create Simple Dashboard. (CO6,L4)

9. (a) Explain how to Analyze Data using a Pivot Table. (CO4,L5)

(or)

(b) Explain how to import data from various sources. (CO1,L5)

10. (a) Create Relationships between Tables in the Model (CO1, L6)

(or)

(b) Discuss how to import Graphs in Power BI. (CO5, L6)