Data Visualization	Code & No:	CS 473	
	Credits:	3(3+1+0)	
	Pre-requisite:	STAT102	
	Co-requisite:		
	Level:	9 or 10	

Course Description:

This course covers the concepts of data visualization techniques in the form of plots used to show the relationships in the data. Different plots and their importance will be covered. Data visualization techniques will be implemented in R or Python.

Course Aims:

1) To prepare data for visualization
2) To cover various data visualization techniques
3) To focus on implementation of practical case studies

Course Learning Outcomes (CLOs):

1. To be able to use R Studio for data loading and transformation
2. To explore the data using bar chart, histogram, boxplot
3. To be able to visualize data using scatterplot
4. To be able to apply data visualization techniques in case studies

No.	Topics	Weeks	Teaching hours
1	Introduction to RStudio- Creating variables and assigning data, vectors and factors, lists, data classes, Looping statements, decision support statements, What is tidyverse?	1	3
2	Data to Insights to Decisions Data Exploration and Visualization with R, Installing and loading tidyverse, Loading and examining a Dataset, Grouping and summarizing a dataset, Plotting a dataset	1	3

3	Loading Data into R, Loading a csv file, Using readr to load data	1	3	
4	Transforming Data, Filtering records to create a subset, Narrowing the list of columns with select(),Summarizing and Grouping	1	3	
5	Creating Tidy Data, Gathering, Spreading, Uniting	1	3	
6	Data Exploration Techniques in R, Bar Chart, Histogram, Box Plots, 2D bin and hex charts, Summary statistics	2	6	
7	Data Visualization Techniques, scatterplot, Adding a regression line, Plotting categories, Labeling the graph, Legend layouts, density plots	2	6	
8	Visualizing Geographic Data with ggmap, Creating a basemap, Adding operational data layers	1	3	
9	R Markdown, Creating an R Markdown file, Using Knit to output an R Markdown file	1	3	
10	Case Study – Wildfire Activity in the Western United States, Case Study – Single Family Residential Home and Rental Values	3	9	
	Total	14	42	

Textbook:

- Eric Pimpler, "Data Visualization and Exploration with R", Geospatial Training Services,2017

Essential References:

1.John D. Kelleher, Brian Mac Namee, Aoife D'Arcy, "Fundamentals Of Machine Learning For Predictive Data Analytics",MIT Press,2015,ISBN: 978-0-262-02944-5
2.Jared P. Lander,"R for Everyone:Advanced Analytics and Graphics",Addison-Wesley,2014