

Data Visualization

1.1 Course Number: MT5604

1.2 Contact Hours: 40 Hours Credits: 11

1.1 Semester-offered: Odd Semester (July-December)

1.3 Prerequisite: Basic knowledge of Excel, R

1.4 Syllabus Committee Member: Dr. Shrawan Kumar Trivedi

2. Objective:

In this course, students will learn describing and building graphs, and how excel, Power BI and the ggplot2 data visualization package for R applies this concept to basic bar charts, histograms, pie charts, scatter plots, line plots, and box plots. they will also learn how to further customize your charts and plots using themes and other techniques. You will then learn how to use another data visualization package for R called Leaflet to create map plots, a unique way to plot data based on geolocation data. This course introduces the creation of interactive dashboards using the Excel, Power BI and R Shiny package. Students will learn how to build hands-on experience by completing sessions and a final project at the end of the course.

3. Course Content:

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures
1	Introduction to Data Visualization	Basics of data visualization using R, Excel, including the fundamental components that are shared by all charts and plots, and how to bring those components to life using the ggplot2 package for R. three common chart types, including bar, histogram, and pie charts, from the qualitative and quantitative data.	10
2	Basic Plots, Maps and Customizations	Relationships between variables, identify outliers and anomalies, and see the trends that can help you predict what the future might bring.	10
3	Dashboards	Why dashboards are important and how to build interactive dashboards using the Shiny package for R and Excel? Also, the role of power BI in dashboard Creation.	10
4	Text Visualization	Topic Clusters, Interactive word clouds, sentiment plots etc.	10
Total			40

4. Readings

4.1 Textbook:

1. Data Visualisation with R: 111 Examples 2nd Edition, Kindle Edition by Thomas Rahlf (Author)
2. Data Visualization with Excel Dashboards and Reports 1st Edition by Dick Kusleika

5. Outcome of the Course:

Students will be able to:

- Create basic visualizations such as line graphs, bar graphs, and pie charts using Excel spreadsheets and R-Studio.
- Explain the important role charts play in telling a data-driven story.
- Construct advanced charts and visualizations such as Tree-maps, Sparklines, Histogram, Scatter Plots, and Filled Map Charts.
- Build and share interactive dashboards using Excel, R-Studio and Power BI.