

## DTC-MBD-516 Data Visualization

**SEMESTER:** Second

**CREDITS:** 30 hours

**LANGUAGE:** Spanish/English

**DEGREES:** Master in Big Data Technologies and Advanced Analytics

### Course overview

The main objective of this course is to open the "datamind" of our students from a visual perspective, focusing on the practical analysis and presentation of real data in a hands-on fashion. We also want to give a fresh "point of view from the front row". This will all be bundled with the key principles of data visualization in order to help develop a critical bundled with the key principles of data visualization in order to help develop a critical mindset.

- Exposure to a number of common data domains and corresponding analysis tasks, including multivariate data, networks, text and cartography.
- Learn how to get faster time-to-insights through different visualization techniques and tools.
- Apply a structured design process to create impactful and effective visualizations.
- Critically evaluate visualizations and suggest improvements and refinements.
- Develop, design and implement a substantial data visualization solution.

### Prerequisites

Basic knowledge of statistics (descriptive statistics, discrete and continuous probability distribution models, sampling and basics of statistical inference) is required for the effective development of visualizations.

Basic knowledge of Programming languages is required, ideally in.

## Course contents

### Theory:

1. Introduction to Data Visualization
2. The Visualization Alphabet
3. Exploratory Data Analysis
4. Advanced Exploratory Data Analysis
5. Grammar of Graphics
6. Perception & Cognition
7. Crash course on aesthetics
8. Geographic visualization
9. Multi-purpose visualization frameworks
10. Real time dashboards for monitorization
11. Programmatic visualizations with Python and R
12. Web apps using shiny

### Textbook

While we will not follow a textbook, we find the following books quite remarkable in their central topics (information visualization, ).

- The Visual Display of Quantitative Information. Edward Tufte
- Now You See it, Stephen Few
- Visual Thinking for Design. Colin Ware
- Information Visualization. Colin Ware
- Visualize This: The FlowingData Guide to Design, Visualization, and Statistics. Nathan Yau.
- Visualization Analysis and Design. Tamara Munzner
- The Elements of Graphing Data. William Cleveland
- Visualizing Data. William Cleveland

*This document is a brief outline of the course and does not replace the official program of study*

- Exploratory Data Analysis. John W. Tukey
- Envisioning Information. Edward Tufte

## Grading

The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10.

The overall grade is obtained as follows:

- ~~AS~~ Short individual tests after each module: 30%
- ~~AC~~ Continuous evaluation of proposed labs for each module: 70%