GENERAL INFORMATION

Data of the subject	
Subject name	Data Visualization
Subject code	DTC-MBD-516
Mainprogram	Master in Big Data Technologies and Advanced Analytics
Involved programs	Máster en Big Data. Tec. y Analítica Avanzada/Master in Big Data Technologies and Advanced Analytics [First year]
Credits	3,0 ECTS
Type	Optativa
Department	Department of Telematics and Computer Sciencies
Coordinator	Luis Francisco Sánchez Merchante

Teacher Information	
Teacher	
Name	Carlos Miguel Vallez Fernández
Department	Department of Telematics and Computer Sciencies
EMail	cmvallez@icai.comillas.edu
Teacher	
Name	Manuel Eusebio de Paz Carmona
Department	Department of Telematics and Computer Sciencies
EMail	medepaz@icai.comillas.edu

DESCRIPTION OF THE SUBJECT

Contextualization of the subject
Prerequisites
Basic knowledge of R and Python

Course contents

Contents
Theme 1: Introduction • Perception and cognition • Visualisation or infographics • Exploration or explanation • Purposes of visualisation

- Graphic excellence
- Bibliography

Theme 2: Visualisation basics

- Same facts, different stories
- Grammar of graphs
- Graphics semantics
- Types of graphs
- Enhancing a graph
- Multidimensional visualisations
- Design tools and environments
- Success stories

Theme 3: Programmatic visualisation

- Using programming languages such as R, Python,…
- Statistical visualisations
- Construction of dashboards
- Exploratory analysis and visualisation

Theme 4: Commercial visualisation environments

- Building dashboards with multipurpose tools such as Tableau, PowerBI, Qlick,…

Theme 5: Real-time metrics visualisation tools

- Trends in tools for building monitoring dashboards

EVALUATION AND CRITERIA

Grading

The grade in the ordinary call of the subject will be obtained as follows:

- 55% will be the grade of the practical exams on the tools.
- 30% will be the qualification of short exams of mainly theoretical content.
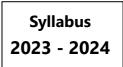- 15% will be the grade for practical work in groups.

The grade in the extraordinary call:

- 20% will be an individual practical exam on a tool chosen by the lecturer.
- 40% will be a theoretical/practical test on the tools and fundamentals of visualisation seen during the course.
- 40% evaluation of work and student participation through the grading of exams and practical work carried out during the course.

In order to pass the course, students must have at least 5 points out of 10 in the final exam block in the ordinary exam session and in the sum of the individual practical exam and multiple-choice exam blocks in the extraordinary exam session.

WORK PLAN AND SCHEDULE

Activities	Date of realization	Delivery date
Reading and study of theoretical content	After each class	
Resolution of the proposed problems or discussions and preparation of the proposed practices.	After each tool block	Until the finishing of the next block
Preparation of the quizzes	During all the semester	

BIBLIOGRAPHY AND RESOURCES

Basic References
They are provided together with the documentation in each thematic block.

Complementary References
The Grammar of Graphics. Wilkinson, Leland. 2005
The Visual Display of Quantitative Information. Edward Tufte. 1983
Storytelling with data. Cole Nussbaumer Knaflic. 2015
R Graphics Cookbook. Winston Chang. 2018
Kibana Essentials. Yuvraj Gupta. 2015
Practical Tableau. Ryan Sleeper. 2018
Microsoft Power BI Complete Reference. Manuel Quintana. 2018
Matplotlib for Python Developers. Sandro Tosi. 2009