Libera Università Internazionale
degli Studi Sociali Guido Carli

LUISS

Syllabus

Academic Year	2026/2027
Program	Data Science and Management
Course	Data Visualization
Term	I semester
Year	I
SSD	IINF-05/A
Credits	6

INSTRUCTIONAL GOALS	The course provides an overview of the principles and latest tools of data visualization. Students will learn how data analysis and visualization should work together to create a powerful way for communicating data-driven findings, motivate analyses, and detect flaws. The course will offer the possibility to apply these techniques to create solutions and have an impact in real-world problems
INTENDED LEARNING OUTCOMES They describe what a learner is expected to know, understand and be able to demonstrate after completion of a learning path.	**Knowledge and understanding**: The course will provide the latest concepts, techniques and tools to develop a successful capability in illustrating the data accurately and effectively. Through the use of concrete examples students will learn how to extract, simplify and communicate meaningful information starting from raw data through the use of the latest visualisation tools. They will learn how to chose the best form of visualization depending both on the data type and audience.. **Applying knowledge and understanding**: At the end of the course the student is expected to • Understand the principles of effectively representing data (how to encode different data dimensions? With what perceptual effects? etc.) • Learn to constructively analyze and criticize a data visualization solution in light of purpose and audience. • Learn how to use the latest tools and software to design data visualization solutions. • Understand the basic principles of interactive interaction and develop the skills to implement interactive visualizations for the web. **Making judgements**: Students will be able to think strategically on how to effectively visualise their data in order to simplify information while highlighting important ideas. Furthermore, they will develop the skills to recognize how different types of data visualization can distract, confuse or mislead, as well as suggest alternatives how the same data can be better presented. **Communication skills:** Throughout the course the students will learn storytelling through visualization. In particular how to make the right data visualization

	choices to communicate their ideas clearly and effectively to diverse audiences. The course will stimulate communication through class discussions, oral presentations and group works. **Learning skills:** The course will empower students with techniques and tools that provide an accessible way to understand trends, outliers, and patterns in data. Learning how to leverage a software tool to effectively represent the data will also enable the students to extract better information and make more effective decisions.
Pre-requisites	Basic knowledge of statistics and computer programming skills. Basic familiarity with Python is recommended.
Course content	The course will cover the following topics: • Principles of visualization designs • Data Visualization with Tableau • Data Visualization with PowerBI • Mathematical and algorithmic aspects of visualization (e.g. clustering, dimension reduction) • Fundamental data visualization libraries in Python. • Interactive data visualization
Reference Books	• Lecture notes, research papers and course material will be made avaiable on the e-learning platform.
Teaching Methods	• The course consists of lectures complemented by practical lab sessions and group project works.
Assessment	• Group Project (1/3) • Individual assignment (1/3) • Final exam (1/3)