



Syllabus

Academic Year	2026/2027
Program	Data Science and Management
Course	Data Science in Action
Term	I semester
Year	1
SSD	INF/01
Credits	6

INSTRUCTIONAL GOALS

The course is designed to be the missing link between model-based analysis (e.g., statistical modeling or simulation) and data-centric techniques (e.g., machine learning and data mining). In particular, the course will make use of many examples of real-life event logs to illustrate the concepts, the techniques and reasoning of modern data scientists. Students will have the opportunity to work in teams to solve real-life problems, by combining models and methodologies learned in class with tools and techniques used for maintaining, analyzing and processing data.

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: Through concrete data sets and algorithmic toolkits, the course will provide a good understanding on how to apply data science methodologies in order solve concrete problems, so as to analyze and improve applications in a variety of domains.

Applying knowledge and understanding: On successful completion of this course students will be able to:

- Design effective solutions to a given data-driven problem using concrete data science methodologies.
- Go through the full data science process, starting from data cleaning, building and training models, execution and quality/performance refinement.
- Deal with real data science applications "in the wild".

Making judgements: Students are expected to be able to analyze different techniques, approaches and models for data science applications. Throughout the entire course, students will be invited to assess critically strengths and weaknesses of different solutions for the same problem.

Communication skills: This course will enhance students' capabilities to communicate effectively their ideas, findings, proposals, analysis and critical reasoning throughout the completion of their project work. A special emphasis will be given to oral presentations and pitches in project group works, and to writing technical reports and documentation.



Learning skills: This course will empower students with the capability to carry out concrete data science projects of industrial interest. A strong emphasis will be given to solving complex business problems that are typical of today's data-driven companies.

Pre-requisites	Basic knowledge of statistics, probability, linear algebra and coding.
Course content	<ul style="list-style-type: none">• Data collection and pre-processing• Feature engineering• Dimensionality reduction and feature selection• Supervised learning• Unsupervised learning• Time series analysis• Optimization problems
Reference Books	<ul style="list-style-type: none">• Slides set of the course and other teaching materials (on Luiss Learn).
Teaching Methods	<ul style="list-style-type: none">• Frontal lectures• Case studies issued by third parties
Assessment	<ul style="list-style-type: none">• Theoretical written test (1/3)• Project (2/3)
