MSc In Data Science

Escuela Técnica Superior de Ingenieros Informáticos

Universidad Politécnica de Madrid

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I'm in charge of the academic aspects of this Master's Degree.

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Web page of the Programme:

https://mucd.dia.fi.upm.es/

Access Moodle, UPM's learning platform, through:
https://moodle.upm.es/titulaciones/oficiales/login/login.php
Access with your credentials @alumnos.upm.es

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Some UPM Technological services:

- Office 365
- Virtual Desktop
- List of services

Msc. in DS: Structure

- 1st Semester
  - The course Introduction to Research Methodology starts this afternoon, first edition. **Classroom 5002**.
  - 8 mandatory courses, 1 elective course.
  - The course Open Data and Knowledge Graphs will concentrate the teaching in the first 8 weeks.

Msc. in DS: Structure

- 2nd Semester, a prelude and 2 parts:
  - On the 27th, 29th, 30th of January, 2026 the second edition of the course *Research Methodology* takes place.
  - 1st part of the 2nd Semester, starting the 2nd of February to the 27th of March, 2026 involves elective courses and 2 mandatory courses.
  - 2nd part is devoted to the Master's Final Project (although you are **strongly encouraged** to start working on it sooner).
  - The course Data Science Seminars runs throughout the whole 2nd Semester.

Calendar 2025-2026

1st Semester Timetable

Timetables 2025-2026

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Teaching Staff

- The Master's Degree brings together the teaching and research expertise in three Departments. It involves Full Professors and Tenured Associate Professors from the three of them:
  - Department of Computer Systems Architecture and Technology
  - Department of Artificial Intelligence
  - Department of Computer Languages and Systems and Software Engineering
- You can find information about the different Research Groups in these departments on the previous web pages.

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Master's Final Project

- Identify a topic of interest. Link this topic to one of the courses in the programme. Contact professors. The sooner you do that, the better.
- Additionally, in December/January a list of proposals from Master's lecturers (professors) will be published. You can select your 5 most preferred. They are very specific, focusing on projects each professor is involved in.
- There is a Moodle space for the Master's Final Project. In UPM's Digital Archive you can browse previously published works https://oa.upm.es/view/masters/Ciencia_de_Datos.html.

Master's Final Project. List of Research Groups linked to the different courses

- Courses: Research Methodology, Open Data and Knowledge Graphs, Deep Learning and others
  Ontology Engineering Group
- Courses: Big Data, Data Visualization
  Center for Computational Simulation
- Courses: Data Processes, Progr. for Data Science and others
  Medical Data Analytics Laboratory (MEDAL)
- Course: Machine Learning
  Computational Intelligence Group

Master's Final Project. List of Research Groups linked to the different courses

- Courses: Deep Learning
  Computer Vision and Aerial Robotics
  Laboratorio de Inteligencia Artificial
- Courses: Cloud Computing and Big Data Ecosystems
  Distributed Systems Laboratory
- Courses: Information Retrieval, extraction and integration
  Biomedical Informatics Group
  Biomedical Informatics Group
- Courses: Statistical Data Analysis
  Decision Analysis and Statistics Group

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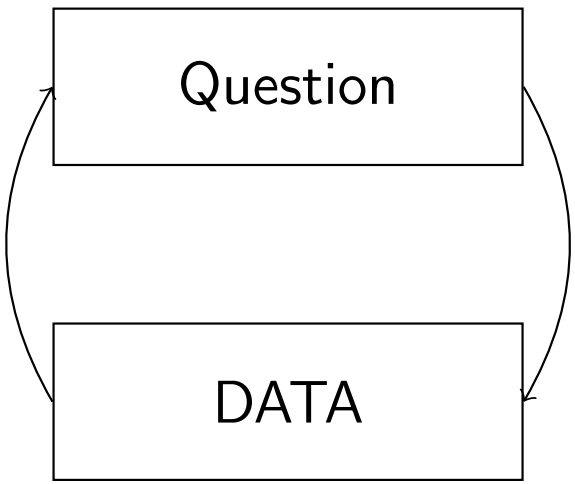
Research Centers to which Master's lecturers belong

- AI.nnovation Space
  Its director is lecturer in the course Graph Analysis and Social Networks
- Center of Biomedical Technology (CTB)
- Center For Computational Simulation Its director is lecturer in the courses Data Visualization and Big Data

General Overview of Data Science



Problem solving
Asking and answering questions with data

The Nature of Data (not Big or Small data but SMART data)

Soft aspects: visualization, analysis, models...
What to do?

Hard aspects: data engineering. How to do it?

Contents Overview

- Data science is inherently interdisciplinary.
- Data science must have a well-defined scope.

Data science, some definitions:

> *Data science involves data and, by extension, statistics, or the systematic study of the organization, properties, and analysis of data and its role in inference, including our confidence in the inference.*
>
> *Data science is the study of the generalizable extraction of knowledge from data.*
>
> *Data Science is the science of (collaboratively) generating, acquiring, managing, analyzing, carrying out inference, and reporting on data.*

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Contents Overview

Courses are designed to cover the different stages of the Data Science Life Cycle:

- Application/Domain Level: referring to the specific application or domain of research.
- Infrastructure Level: computational skills and technologies.
- System level: Hardware and other technological structures including compute infrastructure, cloud computing systems, data structures, etc.
- Science of Data Science Level: including data science ethics; reproducibility; and policy and legal aspects.

Taken from: The Data Science Life Cycle: A Disciplined Approach to Advancing Data Science as a Science, by Victoria Stodden. Available online.

Welcome Session on Monday 8th of September, 12:30h

Welcome Session by the Dean of Academic Affairs.

When: Monday 8th of September, 12:30h.

Where: Salón de Actos, Block I