General Outcomes:

General outcomes for the Master's in Data Science program were established pursuant to recommendations in Royal Decree (RD) 1393/2007 and 1027/2011, as well as national (Universidad Politécnica de Madrid, Community of Madrid) and international institutions and networks (EURO-INF). For the students, these general outcomes entail:

Program Outcomes	Original Outcomes	Outcome definition
CG1	CB6	To acquire scientific knowledge, enabling the student to be original in the development or application of new ideas within the context of research.
CG2	CB7	To apply acquired knowledge and problem-solving skills in new, unfamiliar or broader contexts related to their field of study.
CG3	CB8	To demonstrate the ability to integrate knowledge and handle complexity, and to formulate judgements with incomplete or limited information, that include reflecting on social and ethical responsibilities related to the application of their knowledge and judgement.
CG4	CB9	To demonstrate the ability to use diverse methods to clearly and unambiguously communicate their conclusions, and the knowledge and rationale underpinning them, to specialist and non-specialist audiences.
CG5	CB10	To be able to plan self-learning and improve personal performance as a foundation for lifelong learning and ongoing professional development.
CG6	EUROINF1	To specify and complete informatics tasks that are complex, incompletely defined, or unfamiliar.
CG7	UPM3 + EUROINF3	To apply state-of-the-art or innovative methods in problem-solving, possibly involving the use of other disciplines.
CG8	EUROINF4	To demonstrate that they can think creatively to develop new and original designs, approaches, methods, etc.
CG9	EUROINF5	To apply and integrate knowledge and understanding of other informatics disciplines in support of study in their own specialist area(s).
CG10	EUROINF7	To describe and explain applicable techniques and methods for their particular area of study and identify their limitations.
CG11	EUROINF8	To gain awareness and understanding of informatics to build models, as well as complex information systems and processes.
CG12	EUROINF9	To be able to contribute to the further development of informatics.
CG13	UPM2 + UPM6 + EUROINF11	To appreciate the skills required to work with, and lead, a team that may be composed of people from different disciplines and different levels of qualification.
CG14	UPM1 + UPM11 + EUROINF12	To communicate effectively, both verbally and through a variety of communications media, to a variety of different audiences, and preferably also in a second language.

CG15	UPM4 + EUROINF13	To demonstrate knowledge of the main principles in project management, risk management and change management, as well as to be able to implement project-management and risk-reduction methodologies.

Research outcomes:

These specific research outcomes are common to all research Master's programs at ETSII. Their description is as follows:

- o CGI1: To acquire advanced scientific knowledge in informatics, enabling the student to be original in the development or application of new ideas within the context of research (EUR-ACE®).
- o CGI2: To demonstrate the ability to identify, locate and obtain required data in a research work, and the ability to design and conduct experimental or analytical investigations, critically evaluate data, and draw conclusions (EUR-ACE®).
- o CGI3: To undertake literature searches and reviews using databases and other sources of information as a necessary step in developing any research work.
- o CGI4: To demonstrate the ability to read and understand research publications and studies within their subject matter, as well as to recognize their scientific value.
- o CGI5: To acquire necessary knowledge on research-funding programs and technology-transfer mechanisms, as well as on current intellectual property right law.

Specific outcomes in Data Science:

These outcomes set this Master's in Data Science apart from other Research Master's Degrees:

- o CECD1: To know the processes of data capture, extraction, handling and transformation in different environments.
- o CECD2: To know and properly select the most suitable storage solution for a given problem, for both structured and non-structured data.
- o CECD3: To demonstrate the ability to use big-data processing tools for both batch and online processing.
- o CECD4: To demonstrate the ability to apply the most adequate visualization technique for the analysis and exploration of data in a given scenario and to communicate the results of the analysis.
- o CECD5: To demonstrate the ability to apply advanced statistical techniques to model, analyze and predict.
- o CECD6: To demonstrate the ability to apply data-mining techniques for classifying, modelling, segmentation and prediction from a data set.
- o CECD7: To demonstrate the ability to build intelligent data-based models.
- o CECD8: To demonstrate the ability to design and manage Data Science projects.
- o CECD9: To demonstrate the ability to apply ethical and legal frameworks in the data profession.
- o CEC10: To demonstrate the ability to use Data Science in a given environment.