

MASTER IN DATA SCIENCE - MADS
2025/2026 – SEMESTER 1
30 ECTS

Module 1: Mathematics for Data Science	MA/OP	UE/Sem.	ECTS
Probability: theory and models	MA	6	6
Optimization and probabilistic methods for machine learning	MA	4	5
Mathematical tools for signal analysis and processing	MA	2	3

Module 2: Programming, Data Management	MA/OP	UE/Sem.	ECTS
Programming with R and PYTHON	MA	4	5
NoSQL Databases & Cloud Computing	MA	4	5

Module 3: Transversal courses	MA/OP	UE/Sem.	ECTS
Applied Philosophy of Science and Data Ethics	MA	2	3
The mathematics of networks: theory and algorithms	MA	2	3

MA : mandatory / OP : optional / CM: lecture / TD : travaux dirigés/WK : workshop

MASTER IN DATA SCIENCE - MADS
2025/2026 – SEMESTER 2
33 ECTS

Module 4: Mathematics for Statistical Learning	MA/OP	UE/Sem.	ECTS
Fundamentals of Statistical Learning	MA	4	5
Mathematical Statistics	MA	4	5
Statistical Methods for High Dimensional Data	MA	4	5

Module 5: Big Data Analytics and Data Visualization	MA/OP	UE/Sem.	ECTS
Big Data Analytics (MiCS)	MA	4	5
Data visualization	OB	2	3

Module 6: Introduction to Machine Learning Methods and Data Mining	MA/OP	UE/Sem.	ECTS
Introduction into Machine Learning Methods and Data Mining	MA	4	5

Module 7: Optional courses - Choice of 1 course among the list (5 ECTS)	MA/OP	UE/Sem.	ECTS
Introduction to Biology for Data Scientists	OP	4	5
Introduction to Deep-Learning (MiCS)	OP	4	5
Statistical Modelling	OP	2 2	5
Cybersecurity tool for threat intelligence and forensics - MCYSD-7	OP		

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2025/2026 – SEMESTER 3

Module 8 - Advanced Courses - Choice of 4 courses among the list (20 ECTS) (no compensation)	MA/OP	UE/Sem.	ECTS
Nonparametric Statistics	OP	4	5
Bioinformatics and Network Analysis in Life Sciences	OP	4	5
Analysis of Complex Networks	OP	3	5
Bayesian Statistics	OP	4	5
Natural Language Processing in Data Science	OP	4	5
Advanced topics in applied Machine Learning	OP	4	5
Programming Machine Learning Algorithms for HPC (HPC)	OP	4	3
Parallel Computing (HPC)	OP	4	4
Computational Methods (MPhys)	OP	3	4
Functional Analysis (MMATH)	OP	4	6

Module 9 – Workshop - Choice of 2 Workshops among the list (10 ECTS)	MA/OP	UE/Sem.	ECTS
Workshop I – “Practical Data Science for the private sector: Forecasting for the Supply Chain & How to build an LLM From scratch”	MA	4	5
Workshop II – Practical Data Science for the Public Sector: Reproducible Pipelines and Time Series Forecasting	MA	4	5

MA : mandatory / OP : optional / CM : lecture / TD : travaux dirigés/WK : workshop

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2025/2026 – SEMESTER 4

Module 10 - Internship or Master Thesis	MA/OP	UE/Sem.	ECTS
Internship or Master Thesis	MA		30