

MASTER OF DATA SCIENCE - MADS
WS 2023/2024 – SEMESTER 1

Module 1: Mathematics for Data Science	MA/OP	UE/Sem.	ECTS
Probability Theory	MA	60	5
Optimization and Numerical Probabilities	MA	60	5
Signal processing	MA	30	3

Module 2: Programming, Data Management and visualization	MA/OP	UE/Sem	ECTS
Programming with R and PYTHON	MA	60	5
NoSQL Databases & Cloud Computing	MA	45	5
Data visualization	MA	30	3

Module 3: Transversal courses	MA/OP	UE/Sem	ECTS
Applied Philosophy of Science and Data Ethics	MA	30	3
Introduction to Graph Theory	MA	30	3

MA : mandatory / OP : optional

MASTER OF DATA SCIENCE - MADS
SS 2023/2024 – SEMESTER 2

Module 4: Mathematics for Statistical Learning	MA/OP	UE/Sem.	ECTS
Fundamentals of Statistical Learning	MA	60	5
Mathematical Statistics	MA	90	5
High Dimensional Statistics	MA	60	5

Module 5: Big Data Analytics	MA/OP	UE/Sem.	ECTS
Big Data Analytics	MA	60	5

Module 6: Introduction to Machine Learning Methods and Data Mining	MA/OP	UE/Sem.	ECTS
Introduction into Machine Learning Methods and Data Mining	MA	60	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	60	5
Prototyping with Deep-Learning	OP	60	5
Statistical Modelling	OP	60	5

MA : mandatory / OP : optional

MASTER OF DATA SCIENCE - MADS
WS 2023/2024 – SEMESTER 3

Module 8 - Advanced Courses - Choice of 4 courses among the list (20 ECTS)	MA/OP	UE/Sem.	ECTS
Nonparametric Statistics	OP	60	5
Introduction to Imaging AI with Applications in Medical Imaging	OP	60	5
Network Analysis in Life Sciences	OP	60	5
Analysis of Complex Networks	OP	60	5
Bayesian Statistics	OP	60	5
Natural Language Processing in Data Science	OP	60	5
Advanced topics in applied Machine Learning	OP	60	5
Parallel and Grid Computing (MiCS)	OP	30	4
Computational Methods (MPhys)	OP	45	4
Functional Analysis (MMATH)	OP	60	6
Module 9 - Workshop	OB/OP	UE/Sem.	ECTS
Workshop I – Actuarial Science	MA	60	5
Workshop II – Practical Data Science for the Public Sector: Reproducible Pipelines and Time Series Forecasting	MA	60	5

MA : mandatory / OP : optional

MASTER OF DATA SCIENCE - MADS
SS 2023/2024 – SEMESTER 4

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

MA : mandatory / OP : optional