38. DATA SCIENCE AND STATISTICAL LEARNING (MD2SL)[i]

Level II

Florence Center for Data Science

Department of Statistics, Computer Science, Applications "G. Parenti"

The course is conducted in collaboration with

IMT School for Advanced Studies Lucca

with the issuance of a joint title

Course coordinator

Chiara Bocci

STUDY PLAN

Subject	Academic Discipline	Credits
Mathematics and Statistics for Data Science		**8**
Optimization	MAT/09	2
Numerical calculus and linear algebra	MAT/08	2
	Of which:	1
		1
Probability and stochastic processes	MAT/06	2
	Of which:	1
		1
Statistical inference and modeling	SECS-S/01	2
Algorithmic Foundations and Programming Skills		**6**
Algorithms and programming in Python and R for data science	INF/01	3
	Of which:	2
		1
Machine learning	ING-INF/05	2
Optimization for machine learning	MAT/09	1
Statistical Learning for Data Science		**6**
Statistical learning	SECS-S/01	2
Geospatial data analysis	SECS-S/01	2
Network data analysis	SECS-S/01	2
Supervised and Unsupervised Learning		**6**
Advanced machine learning	MAT/09	3
Deep learning, neural networks, and reinforcement learning	ING-INF/05	3
	Of which:	2
		1
Complex Systems		**6**
Text mining and NLP	ING-INF/05	2
Network and media analysis	FIS/03	2
Complex system analysis	FIS/03	2
Decision Theory for Data Science		**7**
Bayesian inference and causal machine learning	SECS-S/01	3
	Of which:	1.5
		1.5
Analytics in economics and business	SECS-P/06	3
Ethics and law for Data Science	IUS/01	1
1) Data Science for Economics		**4**
Experiments and real-world evidence in economics - Part A	SECS-P/02	1
Experiments and real-world evidence in economics - Part B	SECS-P/01	1

Policy evaluation and impact analysis	SECS-P/06	2
2) Data Science for Business		**4**
Time series analysis	SECS-S/03	2
Optimization of financial portfolios	SECS-S/06	2
	Of which:	1
		1
3) Data Science for Health		**4**
Health analytics and data-driven medicine	SECS-P/02	2
	Of which:	1
		1
Environmental and genomic data analysis	MED/01	2
	Of which:	1
		1
Hands-on labs	**SECS-S/01**	**3**
	Of which:	1.5
		1.5
Total credits for face-to-face classes		**50**
Seminars, real-case studies by colleagues and partners		**2**
Internship/practical training (25 hours/CFU)		**9**
Final examination		**3**
		64

SINGLE MODULES

Subject	**Academic Discipline**	**Credits**
Algorithmic Foundations and Programming Skills		**6**
Algorithms and programming in Python and R for data science	INF/01	3
Machine learning	ING-INF/05	2
Optimization for machine learning	MAT/09	1
Statistical Learning for Data Science		**6**
Statistical learning	SECS-S/01	2
Geospatial data analysis	SECS-S/01	2
Network data analysis	SECS-S/01	2
Supervised and Unsupervised Learning		**6**
Advanced machine learning	MAT/09	3
Deep learning, neural networks, and reinforcement learning	ING-INF/05	3
Complex Systems		**6**
Text mining and NLP	ING-INF/05	2
Network and media analysis	FIS/03	2
Complex system analysis	FIS/03	2
Decision Theory for Data Science		**7**
Bayesian inference and causal machine learning	SECS-S/01	3
Analytics in economics and business	SECS-P/06	3
Ethics and law for Data Science	IUS/01	1

Access prerequisites	To be eligible to attend individual modules, one must hold one of the qualifications listed for admission to the Master Course.
Admission test	The selection of applicants for enrollment in individual modules will occur **if the number exceeds the available places** and consists of an interview.

[i] This document is a translation of the form A.2 relating to the study plan of the course attached to the Decree of the Deputy number 873 (record 158006) of 25th of July 2022, drafted in Italian and issued on the Master | Didattica | Università degli Studi di Firenze | UniFI and which therefore constitutes the only official document. This English translation cannot be used for legal purposes and has the sole purpose of supplying information in English on the content of the public notice.