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
Bootcamp courses		
Mathematics and Statistics for Data Science		**10**
Optimization	MAT/09	2
Numerical calculus and linear algebra	MAT/08	2
Probability and stochastic processes	MAT/06	2
Statistical inference	SECS-S/01	2
Statistical modelling	SECS-S/01	2
Algorithmic Foundations and Programming Skills		**6**
Algorithms and programming in Python for data science	INF/01	2
Algorithms and programming in R for data science	SECS-S/01	1
Machine learning	ING-INF/05	2
Optimization for machine learning	MAT/09	1
Core courses		
Statistical Learning for Data Science		**6**
Statistical learning	SECS-S/01	2
Geo-spatial 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
Complex networks analysis	FIS/03	2
Complex system analysis	FIS/03	2
Decision Theory for Data Science		**7**
Bayesian causal inference	SECS-S/01	3
Analytics in economics and business	SECS-P/06	3
Ethics and law for data science	IUS/08	1
Elective courses *Due insegnamenti a scelta tra*		
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

Subject	Academic Discipline	Credits
Financial risk management	SECS-S/06	2
3) Data Science for Health		**4**
Health analytics and data-driven medicine	SECS-P/02	2
Environmental and genomic data analysis	MED/01	2
Hands-on labs	IUS/01	**4**
Total credits for face-to-face classes		**53**
Seminars, real-case studies by colleagues and partners		2
Internship/practical training (25 hours/CFU)		9
Final examination		3
Total		**67**

SINGLE MODULES

Subject	Academic Discipline	Credits
Algorithmic Foundations and Programming Skills		**6**
Algorithms and programming in Python 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
Geo-spatial 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
Complex networks analysis	FIS/03	2
Complex system analysis	FIS/03	2
Decision Theory for Data Science		**7**
Bayesian causal inference	SECS-S/01	3
Analytics in economics and business	SECS-P/06	3
Ethics and law for data science	IUS/08	1