

**42. DATA SCIENCE AND STATISTICAL LEARNING (MD2SL)<sup>i</sup>**

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
<b>First block – Bootcamp courses</b>		
<b>Mathematics and Statistics for Data Science</b>		<b>10</b>
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
<b>Algorithmic Foundations and Programming Skills</b>		<b>6</b>
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
<b>Second block – Core courses</b>		
<b>Statistical Learning for Data Science</b>		<b>6</b>
Statistical learning	SECS-S/01	2
Geo-spatial data analysis	SECS-S/01	2
Network data analysis	SECS-S/01	2
<b>Supervised and Unsupervised Learning</b>		<b>6</b>
Advanced machine learning	MAT/09	3
Deep learning, neural networks, and reinforcement learning	ING-INF/05	3
<b>Complex Systems</b>		<b>6</b>
Text mining and NLP	ING-INF/05	2
Complex networks analysis	FIS/03	2
Complex system analysis	FIS/03	2
<b>Decision Theory for Data Science</b>		<b>7</b>
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
<b>Third block – Elective courses</b> <i>Two courses to choose from</i>		
<b>1) Data Science for Economics</b>		<b>4</b>
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
<b>2) Data Science for Business</b>		<b>4</b>
Time series analysis	SECS-S/03	2
Financial risk management	SECS-S/06	2
<b>3) Data Science for Health</b>		<b>4</b>
Health analytics and data-driven medicine	SECS-P/02	2
Environmental and genomic data analysis	MED/01	2

<b>Hands-on labs</b>	INF/01	<b>4</b>
<b>Totale CFU didattica frontale</b>		<b>53</b>
Seminars, real-case studies by colleagues and partners		2
Tirocinio		9
Prova finale		3
<b>Totale CFU</b>		<b>67</b>

### SINGLE MODULES

Subject	Academic Discipline	Credits
<b>Algorithmic Foundations and Programming Skills</b>		<b>6</b>
Algorithms and programming in Python for data science	INF/01	3
Machine learning	ING-INF/05	2
Optimization for machine learning	MAT/09	1
<b>Statistical Learning for Data Science</b>		<b>6</b>
Statistical learning	SECS-S/01	2
Geo-spatial data analysis	SECS-S/01	2
Network data analysis	SECS-S/01	2
<b>Supervised and Unsupervised Learning</b>		<b>6</b>
Advanced machine learning	MAT/09	3
Deep learning, neural networks, and reinforcement learning	ING-INF/05	3
<b>Complex Systems</b>		<b>6</b>
Text mining and NLP	ING-INF/05	2
Complex networks analysis	FIS/03	2
Complex system analysis	FIS/03	2
<b>Decision Theory for Data Science</b>		<b>7</b>
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

<sup>i</sup> 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 848 (record 153310) of 2th of July 2024, 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