MD2SL

FLORENCE center for DATA SCIENCE

IMT SCUOLA ALTI STUDI LUCCA

UNIVERSITÀ DEGLI STUDI FIRENZE

ONLINE OPEN DAY 2024

2ND LEVEL MASTER COURSE IN DATA SCIENCE AND STATISTICAL LEARNING (MD2SL)

WHAT'S MD2SL?

The 2nd Level Master in Data Science and Statistical Learning (MD2SL) is promoted by the Florence Center for Data Science, through the Department of Statistics, Computer Science, Applications "G. Parenti" (DISIA) of the University of Florence and the IMT School for Advanced Studies Lucca.

The master MD2SL aims to equip professionals with extensive theoretical knowledge of more advanced statistical, IT and computational tools, allowing them to use and critically evaluate the potential of different methods to extract information from the increasing amount of data available in diverse application areas, with particular reference to applications in the economic, business and health sectors, to provide research questions and foster innovation.

STRUCTURE OF THE PROGRAM

The MD2SL master includes **16 hours of lectures per week**, from Wednesday to Friday from 15.30 to 19.30 and on Saturday from 9.00 to 13.00.
Lectures are given in **synchronous classes** and are offered in a **blended mode** (both online and face-to-face). It is compulsory to attend at least the **75% of the lectures**.
However, the final exams must in all cases be taken in person in Florence, Italy.

The course is recognized by the Ministry of University and Research as a 2nd level Academic Master and allows for the acquisition of 64 ECTS (CFU).

COURSE OF STUDY

1. DATA SCIENCE BOOTCAMP

Provides a solid knowledge on the foundations of Data Science

- Mathematics and Statistics for Data Science
- Algorithmic Foundations and Programming Skills

2. CORE COURSES

Provide theoretical and practical skills in Data Science and Data Analytics

- Statistical Learning for Data Science
- Supervised and Unsupervised Learning
- Complex Systems
- Decision Theory for Data Science

3. ELECTIVE COURSES

Provide specific skills in the fields of economics and business or health and medical science, organized in three possible tracks

- Data Science for Economics
- Data Science for Business
- Data Science for Health

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1st Block
DATA SCIENCE BOOTCAMP

Course	SSD	CFU	Hours
Mathematics and Statistics for Data Science		**10**	**80**
Optimization	MAT/09	2	16
Numerical Calculus and Linear Algebra	MAT/08	2	16
Probability and Stochastic Processes	MAT/06	2	16
Statistical Inference	SECS-S/01	2	16
Statistical Modeling	SECS-S/01	2	16
Algorithmic Foundations and Programming Skills		**6**	**48**
Algorithms and programming in Python for data science	INF/01	2	16
Algorithms and programming in R for data science	SECS-S/01	1	8
Machine Learning	ING-INF/05	2	16
Optimization for Machine Learning	MAT/09	1	8

2nd Block
CORE COURSES

Course	SSD	CFU	Hours
Statistical Learning for Data Science		**6**	**48**
Statistical Learning	SECS-S/01	2	16
Geo-spatial data analysis	SECS-S/01	2	16
Network data analysis	SECS-S/01	2	16
Supervised and Unsupervised Learning		**6**	**48**
Advanced Machine Learning	MAT/09	3	24
Deep Learning, Neural Networks, and Reinforcement Learning	ING-INF/05	3	24
Complex Systems		**6**	**48**
Text Mining and NLP	ING-INF/05	2	16
Complex Networks Analysis	FIS/03	2	16
Complex System Analysis	FIS/03	2	16
Decision Theory for Data Science		**7**	**56**
Bayesian Causal Inference	SECS-S/01	3	24
Analytics in Economics and Business	SECS-P/06	3	24
Ethics and Law for Data Science	IUS/01	1	8
Hands-On Labs	**SECS-S/01**	**4**	**32**

3rd Block
ELECTIVE COURSES
Two tracks to select from the following:

Course	SSD	CFU	Hours
1) Data Science for Economics		**4**	**32**
Experiments and real-world evidence in economics	SECS-P/01 SECS-P/02	2	16
Policy Evaluation and Impact Analysis	SECS-P/06	2	16
2) Data Science for Business		**4**	**32**
Time Series Analysis	SECS-S/03	2	16
Financial risk management	SECS-S/06	2	16
3) Data Science for Health		**4**	**32**
Health Analytics and Data-driven Medicine	SECS-P/02	2	16
Environmental and Genomic Data Analysis	MED/01	2	16

There will be exams at the end of each module.

The qualification will be issued upon verification of attendance and after a final exam, which will consist in the presentation of a project on the application of one of the methodologies introduced during the master to real case studies, usually resulting from the internship experience.

FINAL ACTIVITIES

Seminars, real-case studies by colleagues and partners	**2 CFU**	**16 ore**
Internship (25 ore per CFU)	**9 CFU**	**225 ore**
Final project	**3 CFU**	

INTERNSHIP

Students will have the opportunity to put the acquired knowledge into practice through a **225-hour internship**

- public or private companies
- research centers and units,
- local authorities
- university

There are 3 possible type of internships:

1. classical internship in a partner organization or not
2. substituting the internship with your own working activity (for the students who are already employed) If the job is aligned with the topic of the master
3. research activity at IMT or UNIFI

PARTNERS

arco
RESEARCH
THAT MAKES
THE DIFFERENCE

ARS TOSCANA
agenzia regionale di sanità

autostrade per l'italia

Baker Hughes

COMUNE DI FIRENZE

Daiichi-Sankyo

findomestic
GRUPPO BNP PARIBAS

gsk GlaxoSmithKline

IFAC

IRPET

IQVIA

linkalab

mermec
engineering

morfo
Advanced Aerodynamics

Powersoft

sdg group

Some info from last editions

Students from different backgrounds: Mathematics, Statistics, Physics, Engineering, Informatics, Finance, Economics, Psychology, Chemistry, Archeology

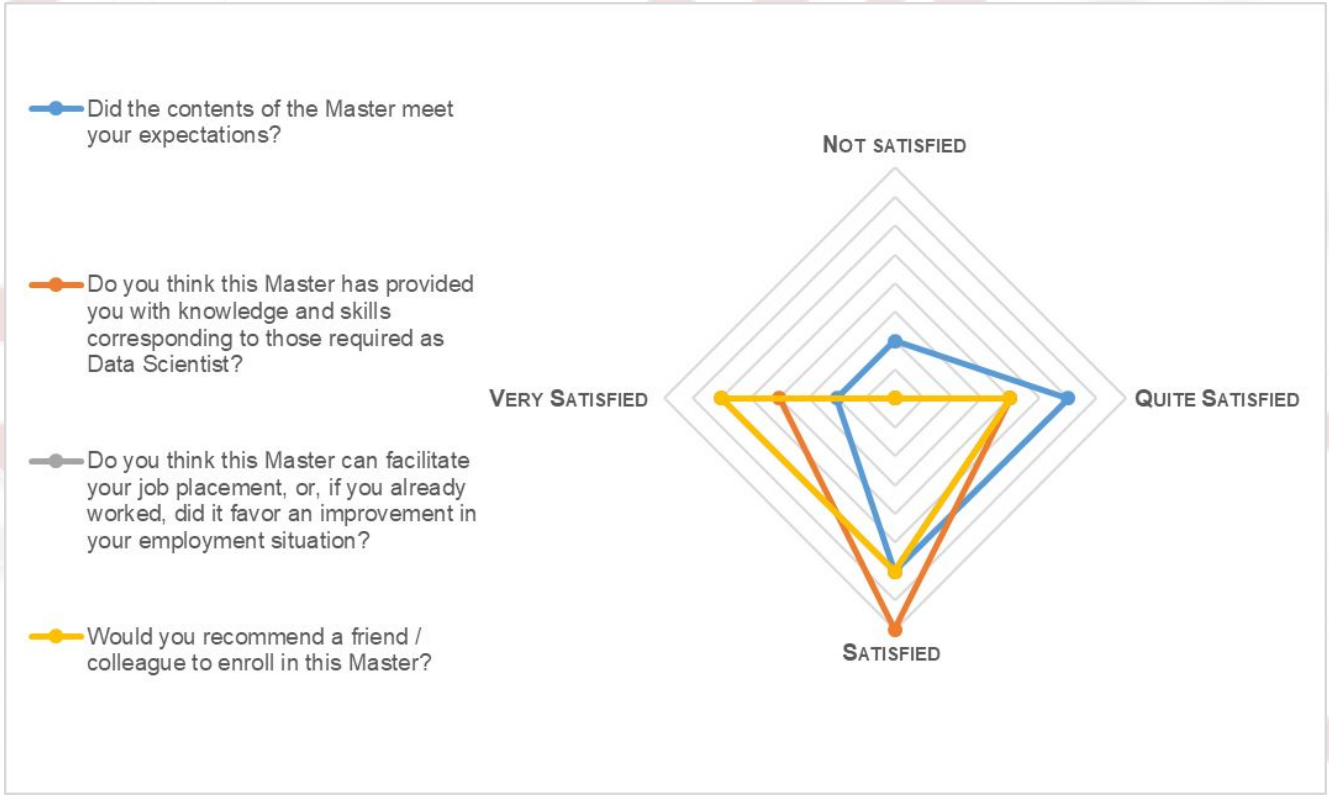
Students now work in these sectors:

- Business Intelligence
- University (PhD and research fellowships)
- Research centers
- Software Development
- Mathematical applications
- Insurance
- Energy
- Computational linguistics
- Epidemiology
- Consulting

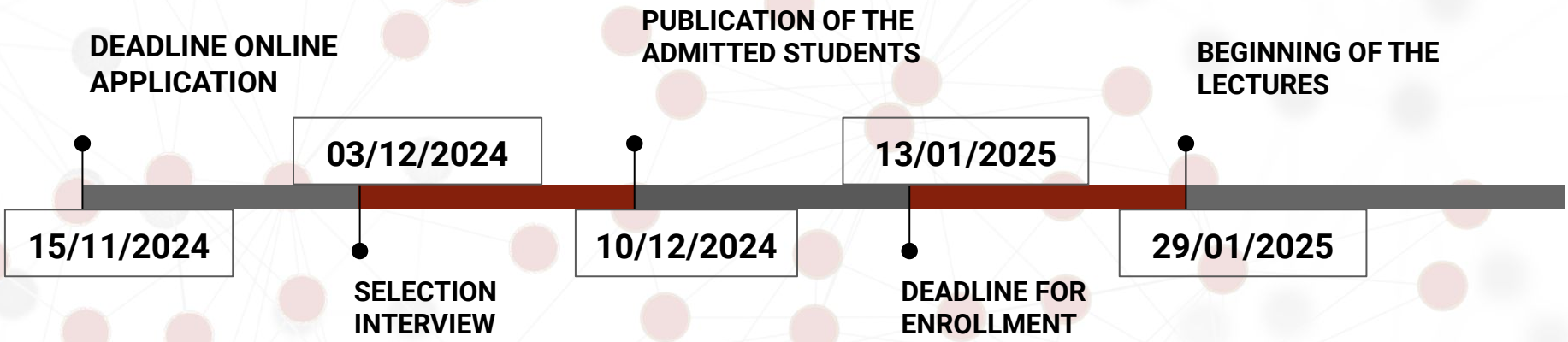
More than 50% of students who worked at the time stated that the Master helped them improving in their job (i.e., skills, qualification etc.)

More than 50% of students who did not work stated that the Master helped them finding a job

Some info from last editions



SELECTION AND DEADLINES



The selection of candidates consists of an examination of the applications and an online interview in English in order to verify the candidate's preparation on statistics, mathematics and programming/computer science as well as their knowledge of English at B2 level, for a successful attendance of the master's courses.

SELECTION AND DEADLINES - Single modules

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09/01/2025 — **DEADLINE ONLINE APPLICATION**

15/01/2025 — **SELECTION INTERVIEW**

22/01/2025 — **PUBLICATION OF THE ADMITTED STUDENTS**

28/01/2025 — **DEADLINE FOR ENROLLMENT**

29/01/2025 — **BEGINNING OF THE LECTURES**

PROGRAM'S COSTS

The enrollment fee of **€ 4,500** can be paid in two equal amounts: the first installment must be paid upon enrollment; the second installment in the following months (for the next edition deadline is the 11th of May 2025).

It is also possible to enroll in **individual modules**. The list of courses available as individual modules is included in the call for applications. In this case, the registration fee is € 100/CFU. To enroll in individual modules it is necessary to have one of the qualifications indicated among those necessary to be admitted to the master.

SCHOLARSHIPS

Each edition, **a variable number of scholarships** are available for Italian or foreign students enrolling in the 2nd level Master in Data Science and Statistical Learning (MD2SL). The scholarship covers the enrollment fee.

The call for **2 merit-based scholarships** for enrollment in the 2nd-level Master's in Data Science and Statistical Learning (MD2SL) will be released soon.

The University awards a **reimbursement scholarship**, upon completion of the Master program, to 10% of enrolled paying students based on merit ranking and ISEE criteria. For details see the *Call for Applications for Master Courses, section 10.4*, at https://www.unifi.it/it/studia-con-noi/dopo-la-laurea/master

KEY INFORMATION

Qualification: 2nd level Master's Degree

Schedule: 16 hours per week, Wednesday- Friday (3.30 - 7.30 pm) and Saturday (9 am - 1 pm), in blended mode

Admission Requirements: Degree from the previous system, specialist/ 2nd-cycle degree, single-cycle degree

Language: English

Deadline call for Application: 15/11/2024

Duration: 29/01/2025 - 31/01/2026

Location: Florence and Lucca (and online)

Enrollment Fee: Master: 4,500€
Individual modules: 100€/CFU

Max Number of Participants: 25

Internship: 225 hours at one of the Master's partners, research centers and university departments

For further information write to

md2sl@disia.unifi.it

Coordinators:

Prof. Chiara Bocci - Univ. of Florence

Prof. Massimo Riccaboni - IMT

www.md2sl.unifi.it

https://www.unifi.it/vp-12152-master.html#interuniversitari