



University of Milano-Bicocca

Master's degree
in Data Science

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Laurea Magistrale in DATASCIENCE

- The Master's Degree program in Data Science of the University of Milano-Bicocca started on 1 October 2017
- It is the first in Lombardy and Northern Italy to train Data Scientists
- Among the top requested jobs in Italy and Europe
- The course aims to train a **generalist** data scientist with a strong focus on **practical aspects**, including numerous mandatory hands-on activities (projects).

Student Satisfaction Rate
96%

Hiring Rate
94%



What does the Data Scientist do

Acquire and manage data of interest,
also considering external signals
(web, IoT, social media)

Extract value from data

Interact with domain specialists to
identify statistical techniques and
information technologies for
downstream applications



Analyze data for descriptive,
predictive, and prescriptive purposes

Present insights to
decision makers

Visualize and communicate the
relevant insights

The three pillars of the course



Since its creation, the master's degree program has been imagined to rest on three pillars



Teachers

Teachers of various departments for all the disciplinary areas involved.



Students

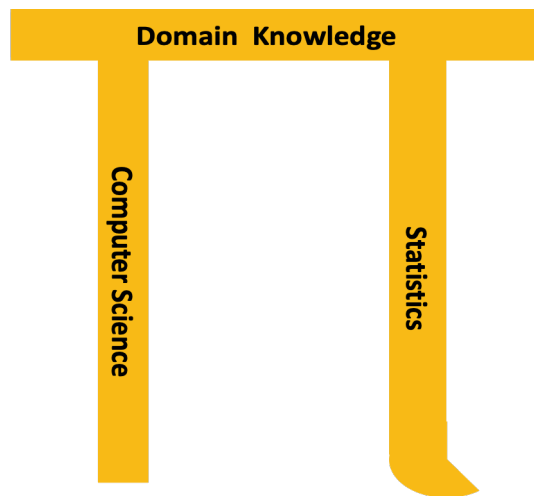
Students with different cultural backgrounds to enable strong interdisciplinary collaboration.



Companies

Companies that collaborate with the Master's degree course by offering internships, data, scholarships and testimonials

Learning Goals of the Master Degree



Distinctive Features

- Strong integration between **theory** and **practical** applications
- Focus on **real-world problems** and large amounts of data
- Preparation suitable for **various fields** (biotech, finance, sport)

MODERN DATA SCIENTIST

Data Scientist, the sexiest job of 21st century requires a mixture of multidisciplinary skills ranging from an intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand who a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

MATH & STATISTICS

- ☆ Machine learning
- ☆ Statistical modeling
- ☆ Experiment design
- ☆ Bayesian inference
- ☆ Supervised learning: decision trees, random forests, logistic regression
- ☆ Unsupervised learning: clustering, dimensionality reduction
- ☆ Optimization: gradient descent and variants

PROGRAMMING & DATABASE

- ☆ Computer science fundamentals
- ☆ Scripting language e.g. Python
- ☆ Statistical computing package e.g. R
- ☆ Databases SQL and NoSQL
- ☆ Relational algebra
- ☆ Parallel databases and parallel query processing
- ☆ MapReduce concepts
- ☆ Hadoop and Hive/Pig
- ☆ Custom reducers
- ☆ Experience with xaaS like AWS

DOMAIN KNOWLEDGE & SOFT SKILLS

- ☆ Passionate about the business
- ☆ Curious about data
- ☆ Influence without authority
- ☆ Hacker mindset
- ☆ Problem solver
- ☆ Strategic, proactive, creative, innovative and collaborative

COMMUNICATION & VISUALIZATION

- ☆ Able to engage with senior management
- ☆ Story telling skills
- ☆ Translate data-driven insights into decisions and actions
- ☆ Visual art design
- ☆ R packages like ggplot or lattice
- ☆ Knowledge of any of visualization

The infographic also features illustrations of a man and a woman, representing data scientists.

Some professional profiles

Analytical Data Scientist

- **Design** the high-level **architecture** of data-driven services
- **Design, adapt and extend** analytical techniques to develop descriptive and predictive **models** for enabling informed decision in any industrial sector.

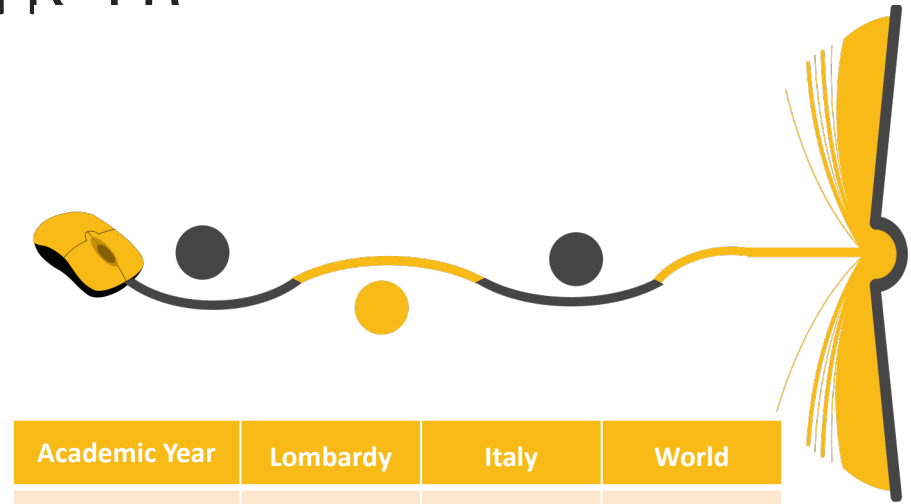


Business Data Scientist

- Identify solutions to **optimize** the value of **business decisions**.
- Design new strategies and services to create values to support **strategic** and **operational decisions**.

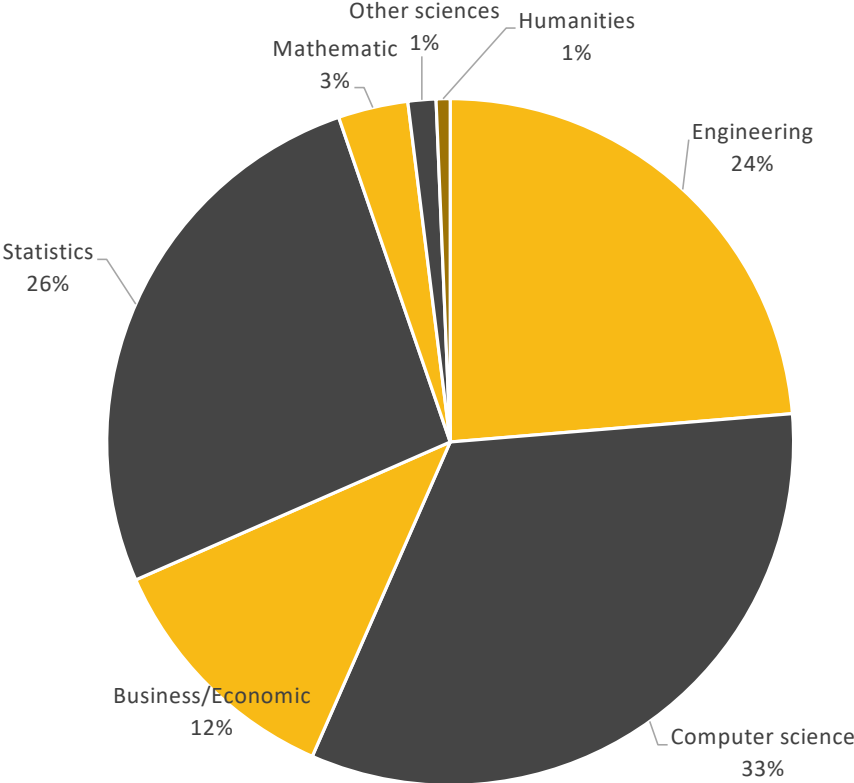
Enrollment

Academic Year	Number of Students
2017/2018	84
2018/2019	101
2019/2020	139
2020/2021	160
2021/2022	110
2022/2023	160
2023/2024	102
2024/2025	130



Academic Year	Lombardy	Italy	World
2017/2018	72%	25%	3%
2018/2019	69%	29%	2%
2019/2020	63%	37%	0%
2020/2021	70%	30%	0%
2021/2022	64%	36%	0%
2022/2023	52%	38%	10%
2023/2024	42%	22%	36%
2024/2025	45%	22%	33%

Background



Admission requirements

MANDATORY

- At least **30 credits** in teachings of the sectors
 - Informatics
 - Computer engineering
 - Statistics
 - Mathematics
 - Physics
- **English language** proficiency at a level not lower than **B2**



- Graduated/ing from bachelor programs in **information technology engineering, computer science, statistics, mathematics and physics**

- degree grade $\geq 83/110$ for graduated students
- 22,5/30 (weighted average mark) for graduating students



- Graduate/ing in **other disciplines**

- degree grade $\geq 83/110$ for graduated students
- 22,5/30 (weighted average mark) for graduating students
- at least 6 credits in computer science, computer engineering
- at least 6 credits in statistics



Admission requirements

Interview:

- Assessment of background knowledge in **computer science**
- Assessment of background knowledge in **probability and statistics**

<https://elearning.unimib.it/course/view.php?id=46152&lang=en>

Interview

1. Programming Fundamentals

- Control structures, functions, input/output (required)
- Data types, object orientation (preferably in Python or R)
- Tabular data management (Dataframe, dplyr, pandas)

2. Data structures and algorithms

- Arrays (required)
- Lists, hashes/dictionaries

3. Operating systems

- Linux shell
- Basic terminal commands (cd, ls, cp, cat)

4. Databases and SQL

- Relational model, SQL queries

1. Fundamentals of Probability

- Sample spaces, events, conditional probability, independence, Bayes' theorem.

2. Random variables and probability distributions

- Discrete and continuous probability distributions, density and distribution functions, expected value and variance

3. Sampling distributions and limit theorems

- Central limit theorem, law of large numbers, distributions of sample mean and variance.

4. Descriptive statistics

- Measures of central tendency, dispersion, frequency distributions, graphical representations.

5. Statistical inference

- Point and interval estimation, confidence intervals, hypothesis testing

6. Linear regression

Course Organization

12 exams:

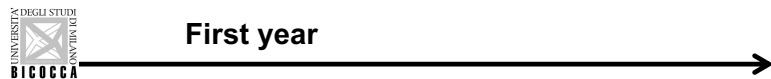
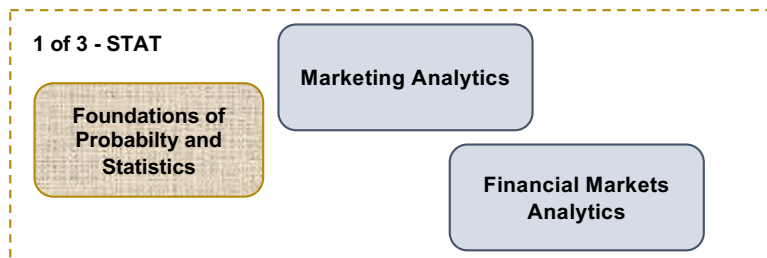
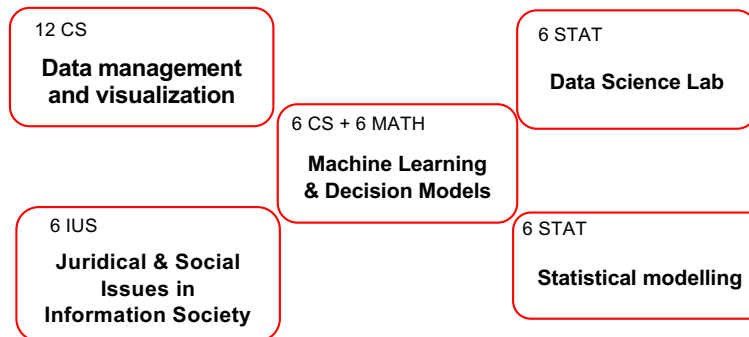
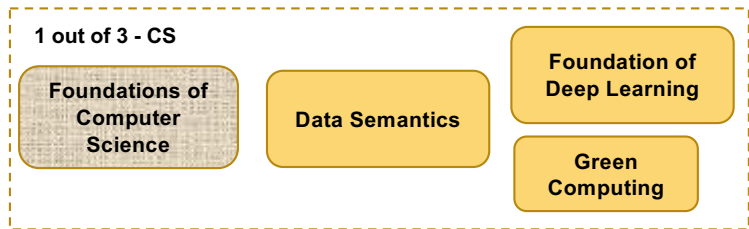
- 7 exams at the 1st year
- 5 exams in the 2nd year

Other activities:

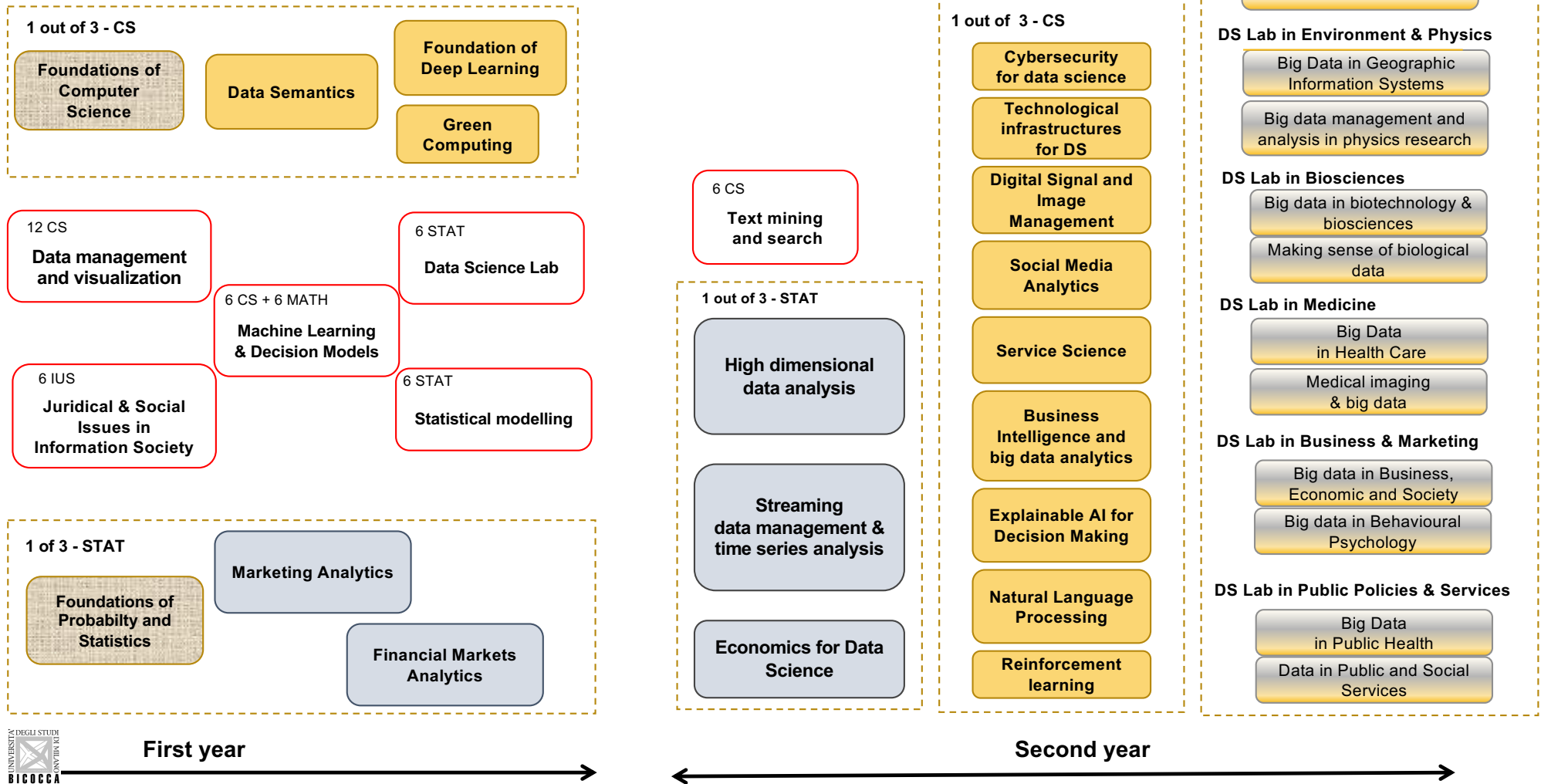
- Further activities:
 - ✓ Linguistic Knowledge
 - ✓ Further skill for job placement
- Internship (at unimib or companies)
- Final Thesis

120 credits

Course organization



Course organization



Our students



<http://www.infodata.ilsole24ore.com>



Some initiatives for our students

Inter data challenge



28/02/24 Milano

FC INTERNAZIONALE DATA SCIENCE CHALLENGE



Application deadlines for the A.Y. 2026/2027

Students holding a **foreign qualification**:

- apply.unimib.it

Students holding an **italian qualification**:

- from April 1 to May 27, 2026
- from May 29 to September 1, 2026

The call for the Academic Year 2026-2027 will be published soon:

<https://www.unimib.it/graduate/data-science> ("Admission and enrollment" section)

The document will include all relevant details (requirements, admission modalities, official deadlines, interview dates, submission instructions)

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That's all folks!