



Manifesto del Corso di laurea magistrale in Data Science

Approvato dal Dipartimento di Matematica in data 18.04.2018
Approvato dal Dipartimento di Ingegneria e Scienza dell'Informazione in data 27.03.2018
Approvato dal Dipartimento di Ingegneria Industriale in data 24.04.2018
Approvato dal Dipartimento di Economia e Management in data 28.03.2018
Approvato dal Dipartimento di Psicologia e Scienze Cognitive in data 11.04.2018
Approvato dal Dipartimento di Sociologia e Ricerca Sociale in data 14.03.2018
Approvato dal Centro Interdipartimentale Mente-Cervello in data 12.04.2018

1. Definitions of terms used in this document

- *Laurea Magistrale in Data Science* = Master of Science in Data Science.
This is what this document is about.
- *Laurea* = *Laurea Triennale* = Bachelor's Degree
This is an Italian Bachelor's Degree, lasting three years.
- *Credito formativo universitario* = CFU = ECTS-credit = Credit
This is the European unit for measuring the value of activities such as a course, an internship, or a thesis. 120 CFU are required for a Master. ECTS stands for European Credit Transfer System.
- *Settore* = *Settore scientifico-disciplinare* = SSD
This is an Italian classification of academic disciplines for the purpose of categorizing teaching and research activities according to subject. The most relevant categories (SSD) for Data Science are the following:

SSD	Italiano	English
INF/01	Informatica	Informatics
ING-INF/05	Sistemi di elaborazione delle informazioni	Information processing systems
IUS/14	Diritto dell'Unione Europea	European Union Law
M-PSI/06	Psicologia del lavoro e delle organizzazioni	Work and organizational psychology
MAT/02	Algebra	Algebra
SECS-P/07	Economia aziendale	Business administration and Management
SECS-P/08	Economia e gestione delle imprese	Management
SECS-P/10	Organizzazione aziendale	Organization studies
SECS-S/01	Statistica	Statistics
SPS/07	Sociologia generale	General Sociology

For other settori see https://www.cun.it/uploads/storico/settori_scientifico_disciplinari_english.pdf

- *Curriculum* (pl. *curricula*)
Within the general framework of the *Laurea Magistrale in Data Science*, the student will be required to follow a study track (*curriculum*) based on her/his previous degree. Each curriculum has different rules for the choice of courses, but in general it will include both elective and required courses.
- *Piano degli studi* = study plan
Each student of the *Laurea Magistrale in Data Science* has to specify her/his choice of courses in a document with this name. (The plural of *piano* is *piani*).
- *Stage*: the Italian term (actually borrowed from French) for an internship.
- *Semestre* (pl. *semestri*) = semester = sem
Teaching is arranged in two periods, conventionally called semesters = six months, although they last only about 14 weeks each. The first *semestre* starts in mid-September and ends a couple of weeks



Dipartimento di Matematica

before the end of December. The second *semestre* lasts from mid-February to the end of May/beginning of June.

- *Corso mutuato* = Mut
This is a course which is offered by a different Department or is a proxy for a course held in a different Department.
- *Corso non attivato* = N.A. = Not Available course
A course that has been active in previous years, and may well be active again in the future, but is not currently offered.

2. “Istituzione e attivazione”

The *Dipartimenti of Mathematics, Sociology and Social Research, Information Engineering and Computer Science, Industrial Engineering, Psychology and Cognitive Sciences, Economics and Management, The Center for Mind/Brain Sciences (Matematica, Sociologia e Ricerca Sociale, Ingegneria e Scienza dell'Informazione, Ingegneria Industriale, Psicologia e Scienze Cognitive, Economia e Management, Centro Interdipartimentale Mente e Cervello)* promote the [Corso di Laurea Magistrale in Data Science](#), belonging to the class “**LM91 – Classe delle Lauree Magistrali in Tecniche e Metodi per la Società per la Società dell'Informazione**”. The degree is activated at the *Dipartimento di Matematica* starting from the Academic Year 2018/19.

3. Instruction language

The courses of the *Laurea Magistrale in Data Science* are taught in English.

4. Goals

The *Laurea Magistrale in Data Science* aims at enabling its graduates to understand and analyze large data sets relating to individual and social behaviour, natural phenomena, or scientific pursuits. The graduates will be able to offer evidence-based support to the decision making process at the executive level, in both the private and the public sector.

5. Curricula

The *Corso di Laurea Magistrale in Data Science* is organized into two *curricula*. A student enrolls in one of the two curricula, according to her/his previous studies, eg.:

- **Curriculum A** is meant for students who have taken a bachelor degree (*Laurea*) in one of the following areas: Computer Science, Mathematics, Physics, Statistics, Engineering.
- **Curriculum B** is meant for students who have taken a bachelor degree (*Laurea*) in one of the following areas: Sociology, Economics, Psychology.



Dipartimento di Matematica

MANDATORY COURSES - CURRICULUM A						
Code	Course	SSD	CFU	Year	Sem	Lecturer
145677	Big Data Technologies	ING-INF/05	6	1	1	Y. Velegrakis
145686	Data Mining	ING-INF/05	6	1	1	Y. Velegrakis
145675	Foundations of Social and Psychological Science					
	Mod. ICT and Social Science theory and models	SPS/07	6	1	1	I. Bison
	Mod. ICT and cognitive psychology theory and models	M-PSI/06	6	1	1	F. Fraccaroli
145678	Professional English for Data Science	L-LIN/12	3	1	1+2	CIAL
145679	Statistical Learning					
	Mod. Statistical Methods	SECS-S/01	6	1	1	D. Giuliani
	Mod. Statistical Models	SECS-S/01	6	1	2	L. Bianchi
145680	Data visualization Lab	INF/01	6	1	2	G. Jurman
145682	Information, Knowledge and Service Management	SECS-P/10	6	1	2	R. Cuel
145681	ICT and Law Privacy and Security	IUS/14	6	1	2	TBA
145684	Introduction to machine learning	INF/01	6	1	2	R. Battiti
OR (*)						
145687	Intelligent Optimization for Data Science	INF/01		1	2	R. Battiti

(*) Students should choose 145687- Intelligent Optimization for Data Science in case they already took a course on introduction to machine learning in their career.

MANDATORY COURSES - CURRICULUM B						
Code	Course	SSD	CFU	Year	Sem	Lecturer
145677	Big Data Technologies	ING-INF/05	6	1	1	Y. Velegrakis
145686	Mathematics for Data Science	MAT/02	6	1	1	A. Caranti
145685	Scientific Programming					
	Mod. Programming	INF/01	6	1	1	A. Montresor
	Mod. Algorithms and Data Structures	INF/01	6	1	1	A. Montresor
145678	Professional English for Data Science	L-LIN/12	3	1	1+2	CIAL
145679	Statistical Learning					
	Mod. Statistical Methods	SECS-S/01	6	1	1	D. Giuliani
	Mod. Statistical Models	SECS-S/01	6	1	2	L. Bianchi
145680	Data visualization Lab	INF/01	6	1	2	G. Jurman
145684	Introduction to machine learning	INF/01	6	1	2	M. Brunato



Dipartimento di Matematica

145680	Computational Social Science	SPS/07	6	1	2	G. Veltri
145681	ICT and Law Privacy and Security	IUS/14	6	1	2	TBA

Students in both **Curricula** should additionally complete the following activities:

- **Elective course - II year** (6 CFU): Students are required to choose 6 CFU from a list of elective courses which will be advertised in due time (see Regulations for further information).
- **Elective laboratories - II year** (12 CFU): Students are required to choose 12 CFU from a list of elective laboratories which will be advertised in due time (see Regulations for further information).
- **Free-choice courses** (12 CFU): Students are required to choose 12 free-choice credits among the courses offered by the University of Trento. The courses listed in the tables above are automatically approved. In all other cases, a personalized study plan must be completed and submitted to the commission for study plan examination.
- **Stage** (9 CFU).
- **Thesis** (18 CFU): The course of studies is concluded with the discussion of an original thesis, under guidance of a supervisor, providing 18 CFU.

6. Admission requirements

To apply to the *Laurea Magistrale in Data Science*, an applicant shall fulfill a list of formal requirements and demonstrate a satisfactory level of personal qualifications.

Applicants must have obtained:

- at least 6 credits in Informatics (INF/*) or Information engineering (ING-INF/*)
- at least 6 credits in Sociology (SPS/*) or Economics (SECS-P/*) or Psychology (M-PSI/*) or Law (IUS/*)
- at least 6 credits in Mathematics (MAT/*) or Statistics (SECS-S/*)
- at least further 24 credits in the above areas

A Bachelor's degree requiring a three-year course of study or longer is mandatory. Additionally applicants should have basic knowledge on the following topics: (a) Mathematics (linear algebra and probability); (b) computer science (foundations of computer programming); (c) basic theoretical and methodological notions of at least one of the following disciplines: social science, economics, psychological science.

The following information is required and shall be provided according to the instructions given in the web site:

- a detailed study plan of the Bachelor's degree, including titles and syllabi of all the courses taken;
- transcript of records from the University that issued the Bachelor's degree reporting, in Italian or English, the list of courses with title, credits and score obtained in each of them and the final score associated to the degree;
- knowledge of English Language of at least B2 level or equivalent, certified by internationally recognized organizations or by the University that issued the Bachelor's degree or by the University of Trento;



Dipartimento di Matematica

- a motivation statement, explaining the reason why the student is willing to apply to the *Corso di Laurea Magistrale in Data Science*, and what she or he expects from it.
- a curriculum vitae and studiorum including personal experience and qualifications of the candidate besides those already stated in the academic record.

The level of personal qualifications of each applicant is evaluated by a Committee. In case of uncertainty on the actual content of courses attended by the candidate, the Committee may require him or her to supply the syllabi of the courses listed in transcript of records or the full diploma supplement. Failure to do so may be considered as insufficient information for the Committee to decide on the appropriate qualification of the candidate.

The Committee requires a personal interview (possibly remotely) with the applicants, to better evaluate their curriculum. The interview can include questions on the main topics studied in the respective applicant's Bachelor's Degree.