

Ms Data Science – Study Plan a.a. 2025/2026

Exam Code	Course Title	SSD		Module	CFU	Semestre	TAF	
I YEAR								
U5383	Mathematical methods for Data Science	MAT/08	MATH-05/A	unico		6	I	B
U5387	Statistical Learning & Data Analysis	SECS-S/01	STAT-01/A	A	6	12	I	B
		SECS-S/01	STAT-01/A	B	6			B
U5393	Fundamentals of programming & Data management	ING-INF/05	IINF-05/A	A	6	12	I	B
		ING-INF/05	IINF-05/A	B	6		II	B
U5386	Hardware and Software for big data	ING-INF/05	IINF-05/A	A	6	12	I	B
		ING-INF/05	IINF-05/A	B	6		II	B
U5390	Data Mining & Machine Learning	SECS-S/01	STAT-01/A	A	6	12	II	B
		INF/01	INFO-01/A	B	6			B
U5396	Theory and Ethics of Big Data and AI	M-FIL/03	PHIL-03/A	unico		6	II	B
II YEAR								
	CURRICULAR COURSE I (*)					12	I/II	C
	CURRICULAR COURSE II					6	I/II	C
	FREE CHOICE COURSE I (**)					6	I/II	D
	FREE CHOICE COURSE II					6	I/II	D
	OTHER ACTIVITIES (***)					6		F
	INTERNSHIP-STAGE OR PROJECT (****)					8		F
	THESIS AND FINAL EXAM					16		E

(*) The CURRICULAR COURSES are defined in **TABLE 1** for each of the following Curriculum/Path:

1. Curriculum FUNDAMENTAL SCIENCES, with possible learning paths:
 - PHYSICS INSPIRED METHODOLOGIES – **FSC/PM**
 - MATHEMATICAL METHODOLOGIES – **FSC/MM**
 - LIFE SCIENCES – **FSC/LS**
2. Curriculum INFORMATION TECHNOLOGIES, with possible learning paths:
 - TEXT AND SPEECH PROCESSING – **ITE/TS**
 - SIGNAL AND VIDEO PROCESSING – **ITE/SV**
 - ROBOTICS AND STATISTICS – **ITE/RS**
 - INDUSTRIAL APPLICATIONS – **ITE/IA**
 - DESIGN AND SECURITY OF AI SYSTEMS – **ITE/AI**
3. Curriculum PUBLIC ADMINISTRATION, ECONOMY AND MANAGEMENT – **ECO**
4. Curriculum INTELLIGENT SYSTEMS - **ISY**

(**) *The TABLE 2 contains the list of courses chosen independently and automatically approved if they are not already present in the curriculum - chosen path. The two courses chosen independently by the student for 6 CFU can be replaced by a single course chosen independently by the student for 12 CFU.* The courses chosen independently by the student for approval can be selected from all those offered in the master's degree courses of the University of Naples Federico II, provided they are consistent with the training path chosen by the student. In this case, the student presents the request for an individual study plan which must be approved by the Teaching Commission of the Course of Studies.

(***) For **foreign students** only, these credits will be granted after obtaining a certificate of knowledge of the Italian language (courses provided by the University Language Center – CLA). For **Italians**, credits can be obtained by acquiring technical skills outside the course of study (e.g. participation in seminars, conferences, tutoring activities, etc.).

(****) The extramoenia internship is carried out in companies, research centers or other public and/or private bodies, Italian or foreign, with the support of a tutor from the company or institution and the supervision of a university tutor. The intramoenia internship is carried out in the university's research laboratories with the support of at least one university tutor (lecturer or researcher).

Type of Training Activity (TAF):

B = Characterizing

C = Affine or Integrative

D = Elective activity

E = Final exam

F = Further training and language skills

List of prerequisites: The course of study does not have any prerequisites.

TABLE 1 – CURRICULAR COURSES CHOICE II YEAR (12 CFU + 6 CFU) – TAF C								
Exam code	Course Title	Module	Disciplinary area		CFU	Sem	Ms Course of Reference	
FSE/PH - CURRICULUM FUNDAMENTAL SCIENCES/PHYSICS INSPIRED METHODOLOGIES								
U5450	Advanced Statistical Learning and Modeling	Advanced Statistical Learning and Modeling Mod A	SECS-S/01	STAT-01/A	6	12	I	DIETI – LM Data Science
		Advanced Statistical Learning and Modeling Mod B	SECS-S/01	STAT-01/A	6		I	DIETI – LM Data Science
NI	Physics Informed Machine Learning	unico	MAT/08	MATH-05/A		6	II	DIETI - LM Data Science
PdS FSE/MM - CURRICULUM FUNDAMENTAL SCIENCES/MATHEMATICAL METHODOLOGIES								
U5430	Algorithms and Parallel Computing and Computational Complexity	Algorithms and Parallel Computing MOD A	INF/01	INFO-01/A	6	12	II	DMRC - LM Ing. Matematica
		Computational Complexity MOD B	INF/01	INFO-01/A	6		I	DIETI - LM Data Science
U1624	Operational Research	unico	MAT/09	MATH-06/A		6	I	DMRC - LM Ing. Matematica
PdS FSE/LS - CURRICULUM FUNDAMENTAL SCIENCES/LIFE SCIENCES								
U7216	Biochemistry and computational biochemistry	Biochemistry	BIO/10	BIOS-07/A	6	12	II	DIETI - LM Data Science
		Computational Biochemistry	BIO/10	BIOS-07/A	6			
U1581	Cell and Molecular Biology	unico	BIO/11	BIOS-08/A		6	I	DICMAPI – LM Bioingegneria industriale
PdS ITE/TS - CURRICULUM INFORMATION TECHNOLOGIES/TEXT AND SPEECH PROCESSING								
U5444	Information Retrieval and Text Mining	Information Retrieval	ING-INF/05	IINF-05/A	6	12	II	DIETI – LM Ing. Informatica
		Text Mining	ING-INF/05	IINF-05/A	6		I	DIETI – LM Data Science
U6636	Speech Processing	unico	L-LIN/01	GLOT-01/A		6	II	DIETI – LM Data Science
PdS ITE/SV - CURRICULUM INFORMATION TECHNOLOGIES/SIGNAL AND VIDEO PROCESSING								
U5444	Information Theory and Signals Theory	Information Theory	ING-INF/03	IINF-03/A	6	12	I	DMRC - LM Ing. Matematica
		Signals Theory	ING-INF/03	IINF-03/A	6		2	DMRC - LM Ing. Matematica
U3423	Image and Video Processing for Autonomous Driving	unico	ING-INF/03	IINF-03/A		6	II	DII - LM Autonomous Vehicle Engineering
PdS ITE/RS - CURRICULUM INFORMATION TECHNOLOGIES/ROBOTICS AND STATISTICS								
U2563	Robotics	Robotics Systems	ING-INF/04	IINF-04/A	6	12	I	DIETI – LM Ing. Informatica
		Robotics Lab	ING-INF/04	IINF-04/A	6		II	DIETI – LM Ing. Informatica
U7207	Advanced Statistical Learning	unico	SECS-S/01	STAT-01/A		6	I	DIETI – LM Data Science
PdS ITE/IA - CURRICULUM INFORMATION TECHNOLOGIES/INDUSTRIAL APPLICATIONS								
U5451	Advanced Statistical Learning and Modeling	Advanced Statistical Learning and Modeling Mod A	SECS-S/01	STAT-01/A	6	12	I	DIETI – LM Data Science
		Advanced Statistical Learning and Modeling Mod B	SECS-S/01	STAT-01/A	6		I	DIETI – LM Data Science
U2659	Statistical Methods for Industrial Process Monitoring	unico	SECS-S/02	STAT-01/B		6	I	DMRC - LM Ing. Matematica
PdS ITE/AI - CURRICULUM INFORMATION TECHNOLOGIES/DESIGN AND SECURITY OF AI SYSTEMS								
U7208	Algorithm Design and Methods of AI	Algorithm Design	INF/01	INFO-01/A	6	12	II	DIETI – LM Informatica
		Methods for Artificial Intelligence	INF/01	INFO-01/A	6		II	DIETI – LM Informatica
U2652	Data Security	unico	ING-INF/05	IINF-05/A		6	I	DIETI – LM Data Science
PdS ECO - CURRICULUM PUBLIC ADMINISTRATION, ECONOMY AND MANAGEMENT								
U7213	Computational Statistical Inference and Categorical Data Analysis	Computational Statistical Inference	SECS-S/01	STAT-01/A	6	12	I	DISES – LM Economia e Commercio
		Categorical Data Analysis	SECS-S/01	STAT-01/A	6		I	DISES – LM Economia e Commercio
U6373	Financial Time Series Analysis	unico	SECS-S/01	STAT-01/A		6	I	DISES – LM Economics and Finance
PdS ISY - CURRICULUM INTELLIGENT SYSTEMS								
U7211	Quantum Computation and Computational Intelligence	Mod I Theory	INF/01	INFO-01/A	6	12	II	DFEP – LM Quantum Science and Engineering
		Computational Intelligence	INF/01	INFO-01/A	6		II	DIETI – LM Data Science
U7215	Generative Artificial Intelligence	unico	INF/01	INFO-01/A		6	I	DIETI – LM Data Science

LEGEND:

DFEP: Dipartimento di Fisica Ettore Pancini; DIETI: Dipartimento di Ingegneria Elettrica e Tecnologie dell'Informazione; DII: Dipartimento di Ingegneria Industriale; DISES: Dipartimento di Scienze Economiche e Statistiche; DMRC: Dipartimento di Matematica e applicazioni Renato Caccioppoli; DICMAPI: Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale; NI: Nuova Istituzione

**TABLE 2 – List of courses with AUTONOMOUS CHOICE for automatic approval
II YEAR (6 CFU + 6 CFU oppure 12 CFU) – TAF D**

Code Exam	Course Title	SSD		CFU	Sem	CdS di riferimento
Curricular Courses Modules if not part of the Curriculum/Path chosen						
U7207	Advanced Statistical Learning	SECS-S/01	STAT-01/A	6	I	DIETI – LM Data Science
U7218	Advanced Statistical Modeling	SECS-S/01	STAT-01/A	6	I	DIETI – LM Data Science
U1643	Algorithms and Parallel Computing	INF/01	INFO-01/A	6	II	DMRC - LM Ing. Matematica
U7219	Computational Intelligence	INF/01	INFO-01/A	6	II	DIETI – LM Data Science
U2652	Data Security	ING-INF/05	IINF-05/A	6	I	DIETI – LM Data Science
U7215	Generative Artificial Intelligence	INF/01	INFO-01/A	6	I	DIETI – LM Data Science
U6373	Financial Time Series Analysis	SECS-S/01	STAT-01/A	6	I	DISES – LM Econ. and Finance
U3423	Image and Video Processing for Autonomous Driving	ING-INF/03	IINF-03/A	6	II	DII - LM Autonomous Vehicle Engineering
U1644	Information Theory	ING-INF/03	IINF-03/A	6	I	DMRC - LM Ing. Matematica
U3522	Methods for Artificial Intelligence	INF/01	INFO-01/A	6	II	DIETI – LM Informatica
U5902	Text Mining	ING-INF/05	IINF-05/A	6	I	DIETI – LM Data Science
Other Courses						
U5494	AI Systems Engineering	ING-INF/05	IINF-05/A	6	I	DIETI – LM Ing. Informatica
U4763	Applied Quantum Systems	FIS/03	PHYS-03/A	6	II	DFEP – LM Quantum Science and Engineering
U1205	Astroinformatics	FIS/05	PHYS-05/A	6	II	DFEP – LM Fisica
U3525	Biometric Systems	INF/01	INFO-01/A	6	II	DIETI – LM Informatica
U3523	Computer Vision	INF/01	INFO-01/A	6	I	DIETI – LM Informatica
U2658	Data visualization	ING-INF/05	IINF-05/A	6	II	DIETI – LM Data Science
U3536	Human robot interaction	INF/01	INFO-01/A	6	I	DIETI – LM Informatica
U3546	Information Systems and Business Intelligence	ING-INF/05	IINF-05/A	6	I	DIETI – LM Ing. Informatica
U3539	Natural Language Processing	INF/01	INFO-01/A	6	II	DIETI – LM Informatica
U1437	Real and Functional Analysis	MAT/05	MATH-03/A	6	I	DMRC - LM Ing. Matematica
U3835	Reliability and Risk in Aerospace Engineering	SECS-S/02	STAT-01/B	6	II	DII – LM Ing. Aerospaziale
U5937	Software Architecture Design	ING-INF/05	IINF-05/A	6	I	DIETI – LM Ing. Informatica
U6635	Techniques of Text Analysis and Computational Linguistic	L-LIN/01	GLOT-01/A	6	I	DIETI – LM Data Science
25880	Advanced Microeconomics	SECS-P/01	ECON-01/A	12	I	DISES – LM Economics and Finance
25881	Advanced Macroeconomics	SECS-P/01	ECON-01/A	12	II	DISES – LM Economics and Finance
27381	Economics of Regulation	SECS-P/03	ECON-03/A	6	II	DISES – LM Economics and Finance
27382	Financial Econometrics	SECS-P/05	ECON-05/A	6	II	DISES – LM Economics and Finance
25884	Mathematics for Economics and Finance	SECS-S/06	STAT-04/A	12	I	DISES – LM Economics and Finance
U6641	Preference learning	SECS-S/01	STAT-01/A	6	I	DISES – LM Economia e Commercio
U6640	SW and methods for statistical analysis of economic data	SECS-S/01	STAT-01/A	6	II	DIETI – LM Data Science