UNIVERSITÀ DEGLI STUDI DI PADOVA

MASTER (LM) DEGREE COURSE IN

DATA SCIENCE

Study programme for students enrolled in the academic year 2025-2026

CURRICULUM DATA SCIENCE – STUDY PLAN MATHEMATICS OF DATA SCIENCE	
1st YEAR	
MANDATORY UNITS	**CREDITS**
STATISTICAL LEARNING C.I.	**12**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
FUNDAMENTALS OF INFORMATION SYSTEMS	**12**
OR 2 COURSES AMONG:	
GAME THEORY	**6**
NETWORK SCIENCE	**6**
PROCESS MINING	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
STOCHASTIC METHODS	**6**
HIGH DIMENSIONAL PROBABILITY FOR DATA SCIENCE	**6**
MANDATORY UNITS	**CREDITS**
MACHINE LEARNING	**6**
DEEP LEARNING	**6**
OPTIMIZATION FOR DATA SCIENCE	**6**
MATHEMATICAL MODELS AND NUMERICAL METHODS FOR BIG DATA	**6**
2nd YEAR	
MANDATORY UNITS	**CREDITS**
STATISTICAL METHODS FOR HIGH DIMENSIONAL DATA	**6**
LAW AND DATA	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
MATHEMATICAL CELL BIOLOGY	**6**
FINANCIAL MATHEMATICS FOR DATA SCIENCE	**6**

MACHINE LEARNING FOR HUMAN DATA	6
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
ADVANCED TOPICS IN DATA SCIENCE	3
SEMINARS AND OTHER ACTIVITIES	3
ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	3
12 ADDITIONAL FREE-CHOICE CREDITS	
INTERNSHIP	**18**
FINAL THESIS/DISSERTATION	**15**

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.

Attendance is recommended but not mandatory.

CURRICULUM DATA SCIENCE – STUDY PLAN BIOLOGICAL DATA ANALYTICS	
1st YEAR	
MANDATORY UNITS	**CREDITS**
STATISTICAL LEARNING C.I.	**12**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
FUNDAMENTALS OF INFORMATION SYSTEMS	**12**
OR 2 COURSES AMONG:	
NETWORK SCIENCE	**6**
BIG DATA COMPUTING	**6**
DEEP LEARNING	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
STOCHASTIC METHODS	**6**
HIGH DIMENSIONAL PROBABILITY FOR DATA SCIENCE	**6**
MANDATORY UNITS	**CREDITS**
MACHINE LEARNING	**6**
STRUCTURAL BIOINFORMATICS	**6**
OPTIMIZATION FOR DATA SCIENCE	**6**
INTRODUCTION TO MOLECULAR BIOLOGY	**6**
2nd YEAR	
MANDATORY UNITS	**CREDITS**
BIOLOGICAL DATA	**6**
LAW AND DATA	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
MATHEMATICAL CELL BIOLOGY	**6**
OMICS IN BIOSCIENCE	**6**
INTRODUCTION TO HUMAN DISEASES	**6**
SYSTEMS BIOLOGY	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
ADVANCED TOPICS IN DATA SCIENCE	**3**

SEMINARS AND OTHER ACTIVITIES	**3**
ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	**3**
12 ADDITIONAL FREE-CHOICE CREDITS	
INTERNSHIP	**18**
FINAL THESIS/DISSERTATION	**15**

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.

Attendance is recommended but not mandatory.

CURRICULUM DATA SCIENCE – STUDY PLAN MACHINE LEARNING FOR INTELLIGENT SYSTEMS	
1st YEAR	
MANDATORY UNITS	**CREDITS**
STATISTICAL LEARNING C.I.	**12**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
FUNDAMENTALS OF INFORMATION SYSTEMS	**12**
OR 2 COURSES AMONG:	
BIG DATA COMPUTING	**6**
PROCESS MINING	**6**
KNOWLEDGE REPRESENTATION AND LEARNING	**6**
REINFORCEMENT LEARNING	**6**
INFORMATION RETRIEVAL	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
STOCHASTIC METHODS	**6**
HIGH DIMENSIONAL PROBABILITY FOR DATA SCIENCE	**6**
MANDATORY UNITS	**CREDITS**
MACHINE LEARNING	**6**
STRUCTURAL BIOINFORMATICS	**6**
OPTIMIZATION FOR DATA SCIENCE	**6**
NATURAL LANGUAGE PROCESSING	**6**
2nd YEAR	
MANDATORY UNITS	**CREDITS**
VISION AND COGNITIVE SYSTEMS	**6**
LAW AND DATA	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
BUSINESS ECONOMIC AND FINANCIAL DATA	**6**
BIOLOGICAL DATA	**6**
BIOINFORMATICS	**6**
COGNITION AND COMPUTATION	**6**

1 UNIT TO CHOOSE AMONG THE FOLLOWING:	CREDITS
ADVANCED TOPICS IN DATA SCIENCE	3
SEMINARS AND OTHER ACTIVITIES	3
ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	3
12 ADDITIONAL FREE-CHOICE CREDITS	
INTERNSHIP	**18**
FINAL THESIS/DISSERTATION	**15**

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.

Attendance is recommended but not mandatory.

CURRICULUM DATA SCIENCE – STUDY PLAN COGNITIVE, SOCIAL AND ECONOMIC DATA ANALYTICS	
1st YEAR	
MANDATORY UNITS	**CREDITS**
STATISTICAL LEARNING C.I.	**12**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
FUNDAMENTALS OF INFORMATION SYSTEMS	**12**
OR 2 COURSES AMONG:	
KNOWLEDGE REPRESENTATION AND LEARNING	**6**
DEEP LEARNING	**6**
PROCESS MINING	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
STOCHASTIC METHODS	**6**
HIGH DIMENSIONAL PROBABILITY FOR DATA SCIENCE	**6**
MANDATORY UNITS	**CREDITS**
MACHINE LEARNING	**6**
NATURAL LANGUAGE PROCESSING	**6**
OPTIMIZATION FOR DATA SCIENCE	**6**
BUSINESS ECONOMIC AND FINANCIAL DATA	**6**
COGNITIVE, BEHAVIORAL AND SOCIAL DATA	**6**
2nd YEAR	
MANDATORY UNITS	**CREDITS**
LAW AND DATA	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
HUMAN COMPUTER INTERACTION	**6**
FINANCIAL MATHEMATICS FOR DATA SCIENCE	**6**
MACHINE LEARNING FOR HUMAN DATA	**6**
COGNITION AND COMPUTATION	**6**
1 UNIT TO CHOOSE AMONG THE FOLLOWING:	**CREDITS**
ADVANCED TOPICS IN DATA SCIENCE	**3**

SEMINARS AND OTHER ACTIVITIES	3
ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	3
12 ADDITIONAL FREE-CHOICE CREDITS	
INTERNSHIP	18
FINAL THESIS/DISSERTATION	15

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.

Attendance is recommended but not mandatory.

CURRICULUM BDMA - BIG DATA MANAGEMENT AND ANALYTICS - STATISTICS & DEEP LEARNING FOR DATA ANALYTICS	
1st YEAR	
MANDATORY UNITS AT ULB - Université Libre de Bruxelles (Belgium) (FIRST SEMESTER OF THE FIRST YEAR)	**CREDITS**
DATA WAREHOUSES	5
DATA MINING	5
BUSINESS PROCESS MANAGEMENT	5
DATABASES SYSTEMS ARCHITECTURE	5
ADVANCED DATABASES	5
HUMANITIES: FOREIGN LANGUAGE	5
MANDATORY UNITS HELD AT UPC - Universitat Politècnica de Catalunya (Spain) (SECOND SEMESTER OF THE FIRST YEAR)	**CREDITS**
BIG DATA MANAGEMENT	6
SEMANTIC DATA MANAGEMENT	6
MACHINE LEARNING	6
VIABILITY OF BUSINESS PROJECTS	6
BIG DATA SEMINAR	2
HUMANITIES: FOREIGN LANGUAGE	2
HUMANITIES: DEBATES ON ETHICS OF BIG DATA	2
2nd YEAR	
MANDATORY UNITS HELD AT THE UNIVERSITY OF PADOVA (FIRST SEMESTER OF THE SECOND YEAR)	**CREDITS**
STATISTICAL LEARNING	6
MACHINE LEARNING FOR HUMAN DATA	6
LAW AND DATA	6
2 UNITS TO CHOOSE AMONG THE FOLLOWING HELD AT THE UNIVERSITY OF PADOVA (FIRST SEMESTER OF THE SECOND YEAR):	**CREDITS**
TIME-SERIES ANALYSIS FOR BUSINESS ECONOMIC AND FINANCIAL DATA	6
BIOLOGICAL DATA	6
PROCESS MINING	6
STOCHASTIC METHODS	6
SEMINARS AND OTHER ACTIVITIES	3

9 ADDITIONAL FREE-CHOICE CREDITS	
INTERNSHIP AND FINAL EXAM HELD AT THE UNIVERSITY OF PADOVA OR AT A PARTNER INSTITUTION (SECOND SEMESTER OF THE SECOND YEAR)	**CREDITS**
INTERNSHIP	**18**
FINAL THESIS/DISSERTATION	**15**

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.

Attendance is recommended but not mandatory.

CURRICULUM TMDS - TRANS MEDITERRANEAN DATA SCIENCE (STUDY PATH ITALY TO SPAIN)	
1st YEAR	
MANDATORY UNITS HELD AT THE UNIVERSITY OF PADOVA	**CREDITS**
FUNDAMENTALS OF INFORMATION SYSTEMS	**12**
MACHINE LEARNING	**6**
STOCHASTIC METHODS	**6**
LAW AND DATA	**6**
STATISTICAL LEARNING (C.I.)	**12**
BIG DATA COMPUTING	**6**
NATURAL LANGUAGE PROCESSING	**6**
OPTIMIZATION FOR DATA SCIENCE	**6**
2nd YEAR	
MANDATORY UNITS HELD AT UPC - UNIVERSITAT POLITÈCNICA DE CATALUNYA (SPAIN)	**CREDITS**
PROCESS-ORIENTED DATA SCIENCE	**6**
SEMANTIC DATA MANAGEMENT	**6**
3 UNITS TO CHOOSE AMONG THE FOLLOWING (INCLUDING 2 UNITS AS FREE CREDITS):	**CREDITS**
ADVANCED STATISTICAL MODELING	**6**
ADVANCED MULTIVARIATE ANALYSIS	**6**
ADVANCED MACHINE LEARNING	**6**
INFORMATION RETRIEVAL AND RECOMMENDER SYSTEMS	**6**
COMPLEX AND SOCIAL NETWORKS	**6**
BIOINFORMATICS AND STATISTICAL GENETICS	**6**
TECHNIQUES AND METHODOLOGY OF INNOVATION AND RESEARCH	**6**
MASTER THESIS (INTERNSHIP + FINAL EXAMINATION)	**30**

ANY FURTHER NOTES

Free-choice credits can be chosen among the university's educational offer as long as they are consistent with the educational path.
Attendance is recommended but not mandatory.