Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

MASTER IN COMPUTING FOR DATA SCIENCE

Study plan by year and semester - Cohorts from 2025/26

Curriculum Machine Learning
The curriculum "Machine Learning" is oriented toward data-driven Artificial Intelligence methods. The curriculum covers principles and methods for data exploration, analysis and visualisation, statistical methods for data analysis, machine learning and deep learning algorithms, and, more generally, methods for the extraction of knowledge from data to inform and guide decision-making processes. In addition to compulsory courses, students can customise their study plan by choosing optional courses for 18 credits and free-choice courses or internships for 12 credits.
Curriculum Artificial Intelligence for Data Management
The curriculum "Artificial Intelligence for Data Management" is focused primarily on data management and, more specifically, on artificial intelligence techniques and methodologies for building IT architectures, infrastructures and systems for storing, maintaining, integrating and curating complex and heterogeneous data, as well as for supporting the subsequent analysis for decision-making processes. In addition to compulsory courses, students can customise their study plan by choosing optional courses for 18 credits and free-choice courses or internships for 12 credits.

Choice of curriculum
By the end of the first semester of the first year, students have to choose which curriculum they intend to follow. Curriculum changes can be made within the first year with the approval of the Master's Degree Programme Council.

Capstone Project
Capstone projects allow the student to apply the scientific and technical knowledge acquired during the study using real data from a specific application domain in areas such as bioinformatics, sensors, internet of things, business information systems, tourism and agriculture.
Capstone projects are project-based courses during which the student works independently on an individual or group project. The project takes place under the supervision of a professor or researcher from the faculty (hereinafter referred to as the tutor), and a domain expert. The tutor is responsible for the course and supervises, directs and evaluates the project. The domain expert introduces the student to the data and characteristics of the application domain and provides requirements, guidance and feedback.
The Capstone Project Coordinator decides annually which capstone projects to activate. The application domains are defined through contacts with the industry in the local area.

Free Choice Courses
Students can freely select 12 Free Choice credit points, if they are consistent with their academic project. The methods for verifying consistency are decided by the Course Council.
To achieve these credits, students may choose courses offered within this programme, any courses offered by this university, any courses offered by other universities, or internships.
For information on internships, please refer to the general internship regulations of the University.
Examinations taken for courses chosen as Free Choice count as a single examination for the purposes of calculating the total number of examinations taken by the student.

Teaching language
The official language of the Master's programme is English.

Curriculum Machine Learning - Study Plan

First Year

Course	CP	Exam
1st Semester		
Algorithms and Data Management for Artificial Intelligence • Data Management and Business Intelligence • Algorithms for Artificial Intelligence	12	yes
Mathematics and Statistics for Data Science	6	yes
Programming and Visualisation for Data Science • Programming in Python • Data Analysis and Visualization	12	yes
	30	
2nd Semester		
Natural Language Processing and Recommender Systems	6	yes
Machine Learning	6	yes
Curriculum-specific optional course	6	yes
Free Choice course or Free Choice internship*	6	yes
	24	

Second Year

Course	CP	Exam
1st Semester		
Capstone Project	6	pass/fail
Deep Learning	6	yes
Large Language Models and Information Retrieval	6	yes
Curriculum-specific optional course	6	yes
Free Choice course or Free Choice internship*	6	yes
	30	
2nd Semester		
Advanced English for Scientific Communication	3	pass/fail
Legal and Ethical Aspects of Artificial Intelligence	3	pass/fail
Curriculum-specific optional course	6	yes
Thesis	24	Graduation
	36	

Curriculum-specific courses

Course	CP	Exam
Advanced Statistics	6	yes
Artificial Intelligence Laboratory	6	yes
Cloud Computing and Distributed Systems	6	yes
Computer Vision	6	yes
Data Curation • Data Preparation and Integration • Data Profiling	12	yes
Data Semantics	6	yes
Parallel Computing	6	yes
Process Mining	6	yes
Real-Time Big Data Processing	6	yes
Time Series Analysis	6	yes

* Free Choice courses or Free Choice internships can be done in any semester; if they are chosen from the list of curriculum-specific courses, they do not have to be approved.

Curriculum Artificial Intelligence for Data Management - Study Plan

First Year

Course	CP	Exam
1st Semester		
Algorithms and Data Management for Artificial Intelligence • Data Management and Business Intelligence • Algorithms for Artificial Intelligence	12	yes
Mathematics and Statistics for Data Science	6	yes
Programming and Visualisation for Data Science • Programming in Python • Data Analysis and Visualization	12	yes
	30	
2nd Semester		
Data Semantics	6	yes
Process Mining	6	yes
Curriculum-specific optional course	6	yes
Free Choice course or Free Choice internship*	6	yes
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Second Year

Course	CP	Exam
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Capstone Project	6	pass/fail
Data Curation • Data Preparation and Integration • Data Profiling	12	yes
Curriculum-specific optional course	6	yes
Free Choice course or Free Choice internship*	6	yes
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Advanced English for Scientific Communication	3	pass/fail
Legal and Ethical Aspects of Artificial Intelligence	3	pass/fail
Curriculum-specific optional course	6	yes
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