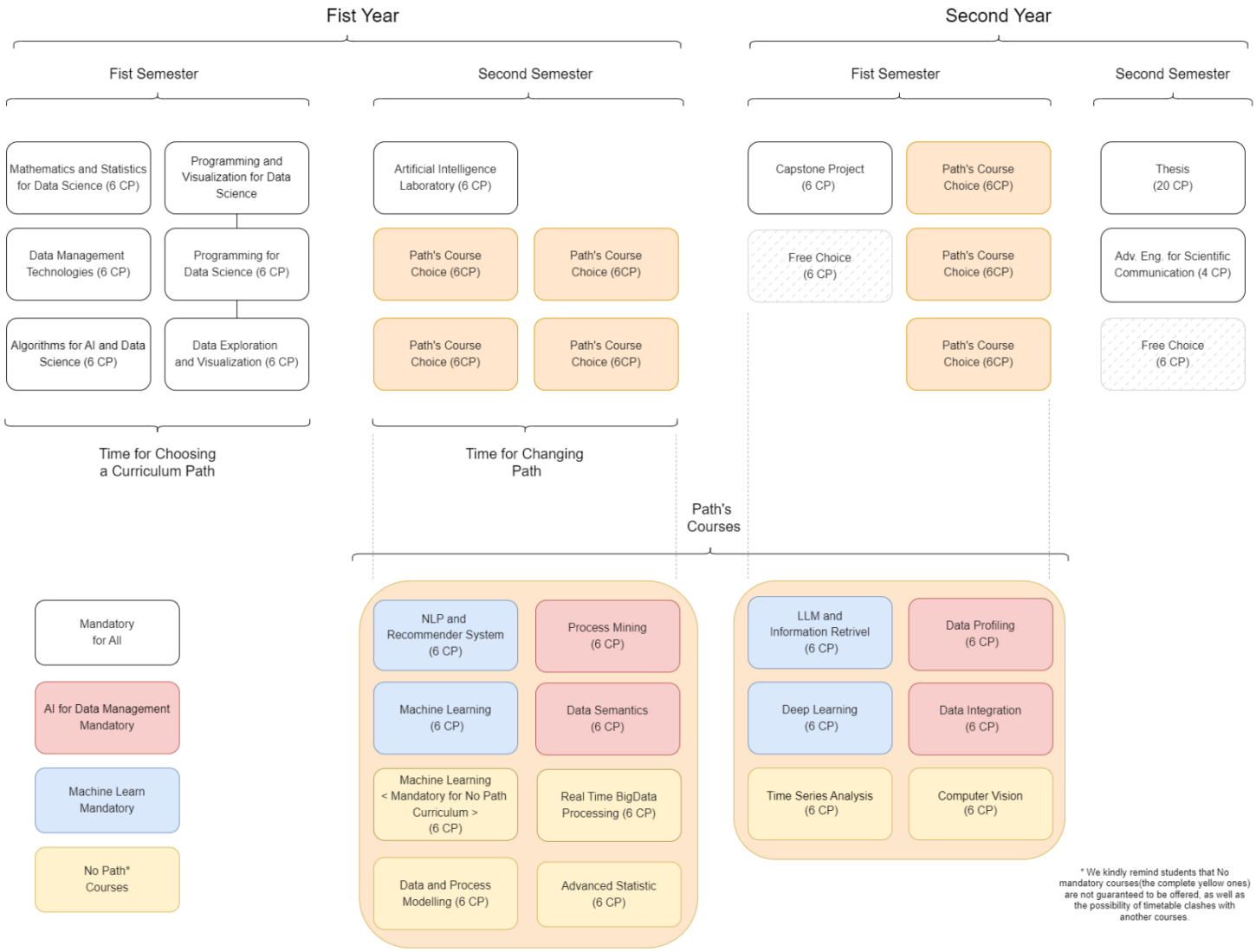
Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

MASTER IN COMPUTING FOR DATA SCIENCE

Study plan by year and semester - Cohorts from 2024/25

Curriculum Machine Learning
The curriculum "Machine Learning" is oriented toward data-driven Artificial Intelligence methods and, in particular, Machine Learning methods for data analysis, including the principles and methods for data exploration, for interpretation and visualization of the results of such analysis, and more generally, for the extraction of knowledge from data to inform and guide decision-making processes. Students can customise their study plan by choosing five optional lectures in addition to the compulsory ones.
Curriculum Artificial Intelligence for Data Management
The curriculum "Artificial Intelligence for Data Management" is focused primarily on data management and on the techniques and methodologies specific to computer science and artificial intelligence for building IT architectures, infrastructures, on systems for maintaining, integrating, and curating complex and heterogeneous data, as well as for supporting the subsequent analysis for decision-making processes. Students can customise their study plan by choosing five optional lectures in addition to the compulsory ones.
Study path without curriculum
Students who prefer not to follow one of the two offered curricula can customise their studies by choosing eight optional lectures in addition to the compulsory ones. At the end of their studies, however, they will not receive any curriculum indication in their Diploma Supplement.

Choice of curriculum
By the end of the first semester the student must choose which curriculum to follow or indicate that he/she does not intend to follow any curriculum. Curriculum changes can be made within the first year with the approval of the Master's Degree Course Council.



* We kindly remind students that No mandatory courses(the complete yellow ones) are not guaranteed to be offered, as well as the possibility of timetable clashes with another courses.

Curriculum Machine Learning - Study Plan

First Year

Lecture	CP	Exam
1st Semester		
Algorithms for AI and Data Science	6	yes
Data Management Technologies	6	yes
Mathematics and Statistics for Data Science	6	yes
Programming and Visualisation for Data Science • Data Visualisation and Exploration • Programming for Data Science	12	yes
	30	
2nd Semester		
Artificial Intelligence Laboratory	6	yes
Natural Language Processing and Recommender Systems	6	yes
Machine Learning	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	

Second Year

Lecture	CP	Exam
1st Semester		
Capstone Project	6	pass/fail
Deep Learning	6	yes
Large Language Models and Information Retrieval	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	
2nd Semester		
Advanced English for Scientific Communication	4	pass/fail
Curriculum-specific optional lecture*	6	yes
Thesis	20	Graduation
	30	

Curriculum-specific lectures

Lecture	CP	Exam
Advanced Statistics	6	Sì/Ja
Cloud Computing and Distributed Systems	6	Sì/Ja
Computer Vision	6	Sì/Ja
Data Curation • Data Preparation and Integration • Data Profiling	12	yes
Data Semantics	6	Sì/Ja
Parallel Computing	6	Sì/Ja
Process Mining	6	Sì/Ja
Real-Time Big Data Processing	6	Sì/Ja
Time Series Analysis	6	Sì/Ja

* The 30 credit points for curriculum-specific optional lectures include the 12 Free choice credit points.

Curriculum Artificial Intelligence for Data Management - Study Plan

First Year

Lecture	CP	Exam
1st Semester		
Algorithms for AI and Data Science	6	yes
Data Management Technologies	6	yes
Mathematics and Statistics for Data Science	6	yes
Programming and Visualisation for Data Science • Data Visualisation and Exploration • Programming for Data Science	12	yes
	30	
2nd Semester		
Artificial Intelligence Laboratory	6	yes
Data Semantics	6	yes
Process Mining	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	

Second Year

Lecture	CP	Exam
1st Semester		
Capstone Project	6	pass/fail
Data Curation • Data Preparation and Integration • Data Profiling	12	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	
2nd Semester		
Advanced English for Scientific Communication	4	pass/fail
Curriculum-specific optional lecture*	6	yes
Thesis	20	Graduation
	30	

Curriculum-specific lectures

Lecture	CP	Exam
Advanced Statistics	6	Sì/Ja
Cloud Computing and Distributed Systems	6	Sì/Ja
Computer Vision	6	Sì/Ja
Deep Learning	6	Sì/Ja
Large Language Models and Information Retrieval	6	Sì/Ja
Machine Learning	6	Sì/Ja
Natural Language Processing and Recommender Systems	6	Sì/Ja
Parallel Computing	6	Sì/Ja
Real-Time Big Data Processing	6	Sì/Ja
Time Series Analysis	6	Sì/Ja

* The 30 credit points for curriculum-specific optional lectures include the 12 Free choice credit points.

Study path without curriculum - Study Plan

First Year

Lecture	CP	Exam
1st Semester		
Algorithms for AI and Data Science	6	yes
Data Management Technologies	6	yes
Mathematics and Statistics for Data Science	6	yes
Programming and Visualisation for Data Science • Data Visualisation and Exploration • Programming for Data Science	12	yes
	30	
2nd Semester		
Artificial Intelligence Laboratory	6	yes
Machine Learning	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	

Second Year

Lecture	CP	Exam
1st Semester		
Capstone Project	6	pass/fail
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
Curriculum-specific optional lecture*	6	yes
	30	
2nd Semester		
Advanced English for Scientific Communication	4	pass/fail
Curriculum-specific optional lecture*	6	yes
Thesis	20	Graduation
	30	

Curriculum-specific lectures

Lecture	CP	Exam
Advanced Statistics	6	Sì/Ja
Cloud Computing and Distributed Systems	6	Sì/Ja
Computer Vision	6	Sì/Ja
Data Curation • Data Preparation and Integration • Data Profiling	12	yes
Data Semantics	6	Sì/Ja
Deep Learning	6	Sì/Ja
Large Language Models and Information Retrieval	6	Sì/Ja
Natural Language Processing and Recommender Systems	6	Sì/Ja
Parallel Computing	6	Sì/Ja
Process Mining	6	Sì/Ja
Real-Time Big Data Processing	6	Sì/Ja
Time Series Analysis	6	Sì/Ja

* The 48 credit points for curriculum-specific optional lectures include the 12 Free choice credit points.

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 lectures 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 lecture 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 Faculty Council decides annually which capstone projects to activate. The application domains are defined through contacts in the local area.

Free Choice Lectures

The credit points reserved for curriculum-specific optional lectures include 12 Free choice credit points.

These 12 Free Choice credit points can be freely selected, provided that they are consistent with the student's academic project. The methods for verifying consistency are decided by the Course Council.

To achieve these credits, students may choose lectures offered within this MSc programme, any lectures offered by the University, or coursinternships.

For information on internships, please refer to the general internship regulations of the University.

Examinations taken for lectures 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 all Master's degree lectures is English.