

Data scientists can be seen as modern-day gold diggers. They dig up relevant information from a huge amount of data and then sort and analyse it as a basis for business decisions as well as developments in science and research. Therefore, data science has a significant influence on the technological advancements of society. Digitalisation not only permeates everyday life, but it also changes the production processes in companies.

In the future, the competitiveness of companies will depend heavily on their ability to generate economic benefits with the help of digitisation and data science projects. Data science is also closely linked to the protection of our environment. For instance, in the near future sensors will analyse the composition of our trash in order to recycle it more purposefully and efficiently. Optimisation potential can also be identified in areas such as energy distribution or transportation, which is the basic requirement for responsible use of our resources.

MONTANUNIVERSITÄT LEOBEN

Franz Josef-Straße 18
8700 Leoben
+43 3842 402-0
unileoben.ac.at
info@unileoben.ac.at

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SUSTAINABLE PROCESSING

INDUSTRIAL DATA SCIENCE



BACHELOR'S & MASTER'S STUDIES

INDUSTRIAL DATA SCIENCE



BACHELOR'S PROGRAMME

Implementing data science in the technical sector and in the producing industry necessitates skills for applying data analysis methods as well as understanding the relevant technical processes. This interdisciplinary linking characterises your study programme Data Science at Montanuniversität Leoben.

Among other things, you will learn about sensor technology and automation, networks and cloud services, mechanical learning and artificial intelligence, simulation and modelling, technical and industrial processes as well as business and economics. You will apply your skills in data acquisition, data analysis and software development in practice within the context of your project paper.

CURRICULUM BACHELOR'S PROGRAMME

7 Semester (210 ECTS)

The first two semesters, in which scientific and engineering fundamentals are taught, are fairly similar for all degree programmes. Starting in the third semester, bachelor's students will be taught profound knowledge that enables them to enter the professional field. A mandatory internship in related industry, as well as the writing of a bachelor's thesis, constitute the requirements for academic degree Bachelor of Science (BSc).

Please note that the main language of instruction for this bachelor's programme is German. At the time of applying, you will have to submit proof of German language proficiency level A2 not older than 2 years, according to the Common European Framework of Reference for Language (CEFR).

Start of Programme and Orientation Phase	Key Skills for Engineers
<ul style="list-style-type: none"> - Transferable Skills - Introduction to STEM 	<ul style="list-style-type: none"> - Chemistry - Mathematics - Physics - Technical Mathematics
Digital Competences and Statistics	Introduction to Study Programme
<ul style="list-style-type: none"> - Introduction to Data Modeling - Algorithms and Programming - Statistics 	<ul style="list-style-type: none"> - Bacc Fundamentals - Fundamentals of Geosciences - Courses from the Elective Catalogue
Mandatory Courses for the Third to Seventh Semester	
<ul style="list-style-type: none"> - Electrical Engineering - Introduction to Machine and Process Design - Physical Principles of Measurement - Industrial Processes and their Measurement Methods - Object-oriented Programming - Constructing Algorithms - Database Software Tools for IT Projects - Computer Engineering, Operating Systems and Networks - Information Security 	<ul style="list-style-type: none"> - Operations Management - Numerical Methods - Introduction to Machine Learning / Lab - Automation Technology - Mathematical Foundations for Data Measurement - Machine Learning Algorithms - Digital Signal Processing - Digital Control of Dynamic Systems - Do-it Lab Industrial Data Science - Free Electives - Course Bachelor's Thesis

You can find a list of detailed curricula from all the study programmes available at Montanuniversität Leoben at unileoben.ac.at.

MASTERS' PROGRAMMES

This master's programme offers you a lot of options to choose from: you can deepen your knowledge in different aspects of data science; you can learn about industrial and scientific problems that can be solved by means of digitalisation; you can learn how to incorporate economical considerations in order to find sustainable solutions.

The entire master's programme is taught in English and will therefore prepare you for international challenges. Like in the bachelor's programme, tasks that are done in groups and teams play an essential role. The specialisation subjects listed in the curriculum can be combined and complemented in a variety of ways.

- Sensors and Data Acquisition (Digital Twins, Automation, Image Processing, ...)
- Prediction and Control (Interactive Machine Learning, Digital Control, Cyber-Physical Systems, ...)
- Data Driven Modelling and Simulation (Numerical Methods, Energy Systems, Logistics Systems, ...)
- Operations and Supply Chain Management (Factory Planning, Process Management, Warehousing, ...)
- Smart Manufacturing (Additive Manufacturing, Digitization in Metal-Forming, Composite Materials, ...)
- Digitization in Tunneling (Underground Structures, Rock Mechanics, Computer Calculations in Subsurface Engineering, ...)

FIELDS OF WORK

As a Data Scientist from Montanuniversität Leoben you can deliver important basis for decision-making via the processing and analysing of big data. By means of digitalisation you can develop sustainable business models and improve technical process with data-based processing.

In the energy sector you can, for example, predict fluctuations in the generation of wind and solar energy in smart energy grids using the data you generate. The development of projects in the fields of data mining and machine learning also fall under your scope of activities.

You can use data science to facilitate work processes in the logistics sector thereby increasing the quality and eco-efficiency of transport services. Industrial enterprises can also operate and optimise their manufacturing procedures because of your contributions in data science. Large technology companies are investing in artificial intelligence and turning available data pools into the fuel for machine intelligence. For this, they need your know-how because the learning algorithm is always only as good as the data which it can access.