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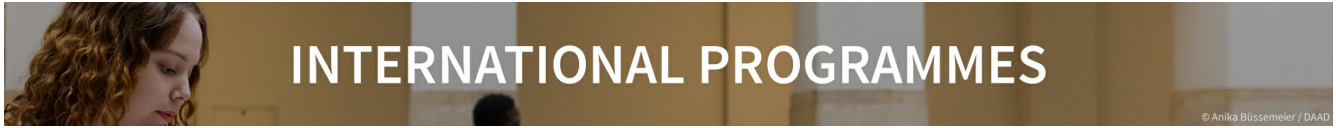
INTERNATIONAL PROGRAMMES

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Master's degree

MSc Data Science

Hochschule Bielefeld – University of Applied Sciences and Arts (HSBI) • Gütersloh

Overview

Degree	Master of Science in Data Science
Course location	Gütersloh
Teaching language	- English
Languages	All courses are taught in English.
Full-time / part-time	- full-time
Programme duration	4 semesters
Beginning	Winter and summer semester
Additional information on beginning, duration and mode of study	**Study model:** full-time study **Start of study:** winter semester & summer semester **Study location:** Gütersloh
Application deadline	EU applicants & non-EU applicants: **15 July** for the following winter semester **15 January** for the following summer semester
Tuition fees per semester in EUR	None
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	**CONCEPT**

In this innovative project-based Master's programme, you will become a data scientist within the area of applied research. You will apply for a research project before the start of the programme and work on it under the close supervision of proven experts throughout the entire Master's programme. This puts you in a position to apply the basic knowledge you have learned directly in practice and thus internalise it in the long term. The Research Master's in Data Science trains engineers for a career in applied science as well as a professional future in the industry. In this unique programme, they become scientists during their Master's degree and publish their work at international conferences in Hamburg, Italy and the USA. After graduation, 50% of graduates begin a doctoral thesis and 50% work as data scientists in the industry.

MOTIVATION

Data science is one of the most important disciplines of the digital age. Almost all objects and processes in the physical world are gradually mapped in the digital world. More and more digital twins are being created to store and make unimaginable amounts of data and new groundbreaking developments available in the field of artificial intelligence. This data changes the way we work, learn and live. As a data scientist, you will not just passively experience this digital revolution, but actively shape it.

STUDY OBJECTIVES

The Research Master's programme trains you to become an applied scientific researcher in the field of data science. The following study objectives will be achieved:

- Mastering data mining methods and algorithms for processing, analysing and exploiting large amounts of data
- Ability to apply machine learning algorithms to develop decision support systems based on large amounts of data
- Development of generative models for the generation of images, videos and text
- In-depth expertise in the development of autonomous software agents based on artificial intelligence
- In-depth skills in the development of autonomous software agents based on artificial intelligence
- Develop, configure and use big data architectures for batch and stream processing, such as Apache Hadoop and Spark
- Mastery of multi-paradigmatic programming with Python and its relevant ML libraries
- Students will gain the ability to perform independent, applied scientific work in interdisciplinary project teams. This includes writing research abstracts, preparing scientific publications, discussing and defending one's own results in a plenary session.
- Mastering agile project management skills to lead innovative project teams
- The ability to reflect on one's own work, especially in light of the limits of scientific knowledge and ethical considerations

Course Details

Course organisation	First semester:

First semester:

- Project Phase I (12 ECTS)
- Introduction to Applied Research (6 ECTS)
- Compulsory elective subject Data Science Introduction to Data Science (6 ECTS)
- Scientific interchange (1 ECTS)
- Project-specific elective module (5 ECTS)

Second semester:

- Project Phase II (7 ECTS)
- Agile Research Project Management (6 ECTS)
- Compulsory elective subject Data Science (6 ECTS)
- Compulsory elective subject Data Science (6 ECTS)
- Project-specific elective module (5 ECTS)

Third semester:

- Project Phase III (12 ECTS)
- Social implication of Data Science (6 ECTS)
- Compulsory elective subject Data Science (6 ECTS)
- Scientific interchange (1 ECTS)
- Project-specific elective module (5 ECTS)

Fourth semester:

- Master's thesis (24 ECTS)
- Colloquium (6 ECTS)

Compulsory elective subject Data Science:

- Introduction to Data Science
- Big Data Architectures
- Data Mining & Machine Learning
- Artificial Intelligence
- Advanced Machine Learning
- Artificial Intelligence for Robotics

A Diploma supplement will be issued	Yes
International elements	- Language training provided - Training in intercultural skills - Integrated/optional study abroad unit(s)
Integrated/optional study abroad unit(s)	There is an opportunity to spend a semester abroad.
Course-specific, integrated German language courses	No
Course-specific, integrated English language courses	No

Costs / Funding

Tuition fees per semester in EUR	None
Semester contribution	Approx. 300 EUR per semester
Funding opportunities within the university	No

Requirements / Registration

Academic admission requirements	**Successfully completed Bachelor's degree** (180 ECTS) with specialisation in Mathematics/ Statistics and Computer Science, e.g. Apparative Biotechnology, Digital Logistics, Digital Technologies, Electrical Engineering, Computer Science, Computer Engineering, Applied mathematics, Mechatronics, Mechatronics/ automation, business informatics. The previous

degree must have been completed with a minimum grade average of 2.5 points.
- **Qualification test**: You will be invited to the qualification test after your documents have been received. After passing the examination, you will draw up a learning agreement with the responsible lecturer. You will then be fully enrolled.

Language requirements	B2 level in English is required, the following language certificates are recognised: - IELTS: score of at least 5.5, - TOEFL (IBT): score of at least 72, - TOEFL (PBT): score of at least 543, - TOEFL (ITP): score of at least 543, - Telc B2 certificate, - UNIcert II, - Cambridge FCE First Certificate in English, - Cambridge English Qualification: score of at least 160 English natives and applicants with a high-school degree or an equivalent university entrance qualification obtained in an English-speaking country can provide proof of their English language skills with a document provided by their school or university stating that the language of instruction was English.
Application deadline	EU applicants & non-EU applicants: **15 July** for the following winter semester **15 January** for the following summer semester
Submit application to	Please visit this website to find out which application portal is right for you: Applying With Certificates Issued Abroad | Hochschule Bielefeld (HSBI).

Services

Support for international students and doctoral candidates	- Welcome event - Buddy programme - Tutors - Accompanying programme - Cultural and linguistic preparation - Help with finding accommodation - Support with registration procedures

Hochschule Bielefeld – University of Applied Sciences and Arts (HSBI)

Hochschule Bielefeld – University of Applied Sciences and Arts
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Excerpt from the mission statement

"In teaching and research, HSBI makes a responsible contribution to social development, with particular commitment to its regional environment. Our teaching serves to educate academically, to qualify for specialist and executive roles and to spark interest in lifelong learning. In research and development, we address big societal challenges. Technology transfer and further education are oriented towards the region's requirements. Diversity and equal opportunities are a matter of course for us. Our learning and working environment is open, inspiring, beneficial and cooperative. HSBI sees itself as a learning organisation."

About HSBI

Founded in 1971, HSBI was one of the first universities of applied sciences in the first wave of Fachhochschulen to open in Germany.

- three campuses: Bielefeld, Minden and Gütersloh
- six faculties: Design and Art, Minden Campus, Engineering and Mathematics, Social Sciences, Bielefeld School of Business, Health
- 10,290 students (12/2023), 788 international students (12/2023)
- 219 professors (10/2023)
- 62 lecturers for special assignments (10/2023)
- 338 academic staff members (10/2023)
- 309 administrative staff members (10/2023)
- 42 Bachelor's programmes
- 28 Master's programmes
- seven certificate programmes
- six research institutes
- two research groups
- system-accredited by the AQAS accreditation commission: HSBI takes responsibility for quality assurance and continuous improvement of study programmes.
- certified as a family-friendly university

Eight good reasons to choose HSBI

1. **Higher education with a practical approach:** HSBI maintains close contacts with the industries, business as well as social and cultural institutions in the region.
2. **High study satisfaction** among students (student survey 2019: 80%)
3. **Studying in all circumstances**: Pre-study and study-accompanied support, different study formats and a wide range of counselling services
4. **The right study format for everyone:** Full-time, work-integrated and part-time study programmes
5. **Career opportunities:** Most graduates find their first permanent job within three months of graduation. Most graduates are highly satisfied with their overall professional situation (student survey 2019: 71%).
6. **The location:** The region of East Westphalia-Lippe is one of the strongest business centres in Germany, especially for medium-sized companies.
7. **Discover the world:** More than 150 partner universities in nearly 50 countries
8. **Bielefeld is a safe city:** Bielefeld is the second safest city in Germany (as of 2021, source).

📍 University location

OWL – worth knowing

- Approx. 2.08 million inhabitants (04/2023)
- 6.9 million overnight stays per year (holiday region Teutoburg Forest)
- OWL (Ostwestfalen-Lippe – East Westphalia-Lippe) is one of the leading technology regions in Europe
- 14 universities with over 67,000 students
- Economically strong region with about 140,000 companies, about one million jobs and a large international network – "hidden champions"
- Gross domestic product (GDP) of the region: around 75 billion EUR per year

Bielefeld – worth knowing

- Approx. 344,000 inhabitants (06/2023)
- Landmark: Sparrenburg (built approx. 1240)
- Places of interest: botanical garden, Kunsthalle museum, Dr. Oetker Welt
- Events: Bielefelder Nachtansichten (festival of light and arts), Weinmarkt (wine festival), Leineweber-Markt (city festival), Theater Bielefeld, DSC Arminia Bielefeld, Heimat-Tierpark Olderdissen (zoo)

Gütersloh – worth knowing

- Approx. 105,000 inhabitants (01/2023)
- The city park and botanical garden are part of the European Garden Heritage Network's (EGHN) "Garden Route of Cultural Events"
- Events: Langenachtderkunst (long night of arts festival), open-air concerts as part of the Gütersloh summer festival, Street Food Festival, Michaeliswoche (city festival), Klanggarten (sound garden)

Minden – worth knowing

- Approx. 85,500 inhabitants (12/2022)
- Biking and hiking trails around the Weser river
- Landmark: Germany's only grinding mill
- Events: Blaues Band der Weser (water sports festival), Gourmetmeile (culinary festival), Sommernachtsgartenfest (city festival), Kultursommerbühne (cultural festival)

Contact

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🌐 Course website: https://www.hsbi.de/studiengaenge/data-science

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International Programmes in Germany - Database

Disclaimer
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Federal Ministry of Education and Research