



Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



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# Master's degree



## Genome Based Systems Biology

Bielefeld University • Bielefeld

### Overview

Degree	Master of Science
Teaching language	<ul style="list-style-type: none"><li>• German</li><li>• English</li></ul>
Languages	<p>Courses are held in English (60%) and German (40%). Participants can choose to write the Master's thesis in either language, but they are encouraged to write their research reports and their Master's thesis in English.</p> <p>The language centres offer a variety of accompanying courses both during the semesters as well as during the semester free time. Moreover, there is always the possibility of seeking individual advice. All courses are free of charge.</p>
Full-time / part-time	<ul style="list-style-type: none"><li>• full-time</li></ul>
Programme duration	4 semesters
Beginning	Winter semester
Application deadline	15 July for the following winter semester
Tuition fees per semester in EUR	None
Combined Master's degree / PhD programme	No
Joint degree / double degree programme	No
Description/content	<p>Systems biology comprises a lot of disciplines. In this field, biology joins forces with disciplines such as bioinformatics, mathematics and physics. The common target is to understand the functionality of cells, organs and even complete organisms.</p> <p>This broadly based Master's programme gives access to research projects in biotechnology, medicine, agriculture, pharmacy and astrobiology, among many others. With a Master's degree in "Genome Based Systems Biology", you can work on biotechnological projects, study diseases or investigate alternative forms of energy. You will be well prepared for a career in science or in economics.</p> <p>With up to 18 students per academic year, this research oriented interdisciplinary Master's course enables intensive supervision and sufficient time to learn the use of complex instruments, evaluate</p>

and analyse complex data and build models.

One aim of systems biology is to establish computer-based models of life processes, allowing to predict the performance of metabolic pathways, cells, organs or whole organisms under certain conditions. This is of major interest for biology, biotechnology and biomedicine.

The increasing use of high-throughput methods in the fields of modern omics technologies, such as genomics, transcriptomics, proteomics and metabolomics, results in massive and complex data. In genomics, gene sequences are identified and annotated to reconstruct metabolic pathways. In transcriptomics, functional genes are analysed to unravel regulatory processes. Subsequently, proteomics helps to identify the respective cellular and extracellular proteins. Finally, metabolomics allows the determination of the majority of metabolites in a cell. Systems biology comprises these methods in order to model the interaction of genes, transcripts, proteins and metabolites in a cell.

Students acquire the profound knowledge in biology, mathematics and bioinformatics needed to understand biological processes, handle the produced data and apply or build mathematical or biological models. As Bielefeld University is famous for its "hands on" culture, students learn how to operate complex measuring instruments and machines.

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## Course Details

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### Course organisation

In the first year, knowledge in basic molecular methods and biological principles is intensified. Simultaneously, mathematical methods to be prepared to build models of biological processes are acquired in a comprehensible manner. Finally, a course of applied bioinformatics completes the basic training in the first two semesters.

The second year covers the scientific profiling along individual interests. This can comprise the practical use of modern instruments and methods in the lab as well as the development of new bioinformatics tools to analyse data or the building of mathematical models. Data can be derived from high-throughput biology and biotechnology, for example.

[» PDF Download](#)

### A Diploma supplement will be issued

Yes

### International elements

- International guest lecturers
- Language training provided
- Projects with partners in Germany and abroad
- Training in intercultural skills

### Special promotion / funding of the programme

- ERASMUS+

### Course-specific, integrated German language courses

No

### Course-specific, integrated English language courses

No

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## Costs / Funding

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Tuition fees per semester in EUR None

**Semester contribution** Since Bielefeld University does not charge tuition fees, every student only has to pay a social fee. The [social fee](#) includes the contribution to the [social ticket](#) for free public transport in the city and area of Bielefeld and on regional trains and buses in North-Rhine Westphalia for the whole semester.

The current semester contribution is approximately 300 EUR.

#### Costs of living

Costs for studying in Germany are relatively high due to the living expenses.

- Rent in a room in student halls of residence or a private student hall, in a room or flat comes to approx. 280 EUR per month.
- The expected costs for student health insurance and other medical fees are about 80 EUR per month.
- Depending on your lifestyle, you might spend about 150 EUR on food each month.
- Altogether, monthly costs for food, clothes, leisure activities, social fees, travel expenses, telephone bills, and the other mentioned expenses add up to approx. 850 EUR.

There are several ways of cutting expenses in Bielefeld. For example, it is possible to rent a room in a student residence for about 230 EUR, and a meal at the student canteen (Mensa) costs only about 2.60 EUR.

Funding opportunities within the university No

## Requirements / Registration

#### Academic admission requirements

Please supply us with your Bachelor's degree (in biosciences or a related field) and your language certificates. Additionally, we are happy to learn more about your motivation. Therefore, a questionnaire is provided. Please upload your answers.

For further information about the application to the Master's programme, please visit: [www.uni-bielefeld.de/bewerbung](http://www.uni-bielefeld.de/bewerbung).

#### Quick Checklist:

- Bachelor's degree/Transcript of Records (including average grade)
- Language level(s): German/English
- "Studierfähigkeitstest" (File with your answers)

#### Optional:

- Curriculum Vitae
- Summary of the Bachelor's thesis
- Additional information

#### Language requirements

As courses and lectures are given either in German or in English, both German and English language skills are prerequisites.

For further information, please see: [www.uni-bielefeld.de/bewerbung](http://www.uni-bielefeld.de/bewerbung).

Application deadline 15 July for the following winter semester

**Submit application to**

Apply via the [online portal](#).

For further information about the application to the Master's programme, please use the following links: [www.uni-bielefeld.de/bewerbung](http://www.uni-bielefeld.de/bewerbung).

## Services

**Possibility of finding part-time employment**

Basically, with your residence permit (stamp in your passport), you will receive a work permit for 120 work days per year. This allows you to work 120 full days (eight hours per day) or 240 half days (up to four hours per day). This condition must be noted expressly in the passport by the authorities.

**Accommodation**

Please try to secure accommodation in Bielefeld as early as possible. In Bielefeld, a broad range of accommodation options can be found at affordable prices. Students residences are run by the public "Studierendenwerk" or private organisations, and shared flats are very common.

Offers of accommodation can be found online by following the links below:

- [Studierendenwerk Bielefeld](#) (dormitories)
- [WG-gesucht.de](http://WG-gesucht.de) (private shared accommodation)

The International Office supports students who are searching for accommodation.

**Career advisory service**

Career planning is a step-by-step development and clarification process that requires individual strategies. Based on a strengths- and resource-oriented approach, we support you in developing your own career prospects.

Depending on your needs, our Career Service at Bielefeld University will accompany you throughout the entire process or in individual steps.

<https://www.uni-bielefeld.de/themen/career-service>

**Support for international students and doctoral candidates**

- Welcome event
- Buddy programme
- Accompanying programme
- Cultural and linguistic preparation
- Visa matters
- Help with finding accommodation
- Support with registration procedures
- Specialist counselling

**General services and support for international students and doctoral candidates**

At PunktUm, our German Learning Centre, we offer a comprehensive range of academic support programmes that are designed to meet the needs of international members of the Bielefeld University. These include the Academic Mentoring Programme for Master's students, the Peer Mentoring Programme for Bachelor's students, and semester-long workshops designed to help all students and researchers with academic writing. We also offer individual consultations on academic writing in German as a Foreign Language (DaF) or German as a Second Language (DaZ).

The International Office provides an orientation programme for all international members of Bielefeld University, including degree seekers (BA and MA), double degree students, Erasmus/cooperation students, doctoral students, scholars, interns, and refugees/preparing applicants. Example of activities include Café International, campus tour, introductions to digital services and administrative procedures.

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# Contact

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🌐 Course website: <https://www.uni-bielefeld.de/fakultaeten/biologie/studium/studieninteressierte/master/gbsb/>

📘 <https://de-de.facebook.com/BielefeldUniversity/>

🐦 <https://twitter.com/unibielefeld?lang=en>

📷 <https://www.instagram.com/bielefelduniversity>

📺 <https://www.youtube.com/bielefelduniversity>

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# International Programmes in Germany - Database

[www.daad.de/international-programmes](http://www.daad.de/international-programmes)  
[www.daad.de/sommerkurse](http://www.daad.de/sommerkurse)

## Editor

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## GATE-Germany

Consortium for International Higher Education Marketing  
[www.gate-germany.de](http://www.gate-germany.de)

## Disclaimer

The data used for this database was collected and analysed in good faith and with due diligence. The DAAD and the Content5 AG accept no liability for the correctness of the data contained in the "International Programmes in Germany" and "Language and Short Courses in Germany".

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