



Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



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# Doctorate



## Berlin Mathematical School – PhD Programme

Technische Universität Berlin • Berlin



## Overview

Degree	Dr rer nat
In cooperation with	Freie Universität Berlin, Institute of Mathematics Humboldt-Universität zu Berlin, Institute of Mathematics
Teaching language	<ul style="list-style-type: none"><li>English</li></ul>
Languages	<p>Courses are held in English. Participants can choose to write the dissertation in English or in German.</p> <p>The BMS offers assistance to those international students with little or no German language skills by covering the costs of one preparatory language course in German as a Foreign Language ("Deutsch als Fremdsprache", also known as "DaF").</p>
Programme duration	6 semesters
Beginning	Winter semester
More information on beginning of studies	October
Application deadline	<p>The <b>first-round application deadline</b> of <b>1 December 2021</b> is for</p> <ul style="list-style-type: none"><li>- phase I applicants requiring <b>admission with a scholarship</b> and</li><li>- phase II applicants who will have earned a Master's degree by 31 March 2022 and want to start before October 2022.</li></ul> <p>The <b>second-round</b> application deadline of <b>1 April 2022</b> is for</p> <ul style="list-style-type: none"><li>- phase I applicants requiring admission only and</li><li>- phase II applicants who will have earned a Master's degree by 30 September 2022 and want to start in October 2022.</li></ul>
Tuition fees per semester in EUR	None
Combined Master's degree / PhD programme	Yes

Joint degree / double degree programme No

#### Description/content

The Berlin Mathematical School (BMS) is the joint doctoral programme of the three Berlin universities and the graduate school of the Cluster of Excellence MATH+. Areas of expertise include:

- [Differential geometry, global analysis and mathematical physics](#)
- [Algebraic and arithmetic geometry, number theory](#)
- [Stochastics and mathematical finance](#)
- [Discrete mathematics and optimisation](#)
- [Geometry, topology and visualisation](#)
- [Numerical analysis and scientific computing](#)
- [Applied analysis and differential equations](#)
- [Mathematics of data science](#)

## Course Details

#### Course organisation

The BMS Programme is divided into two phases:

**Phase I** (four semesters) leads students from the Bachelor's degree to the BMS Qualifying Exam. Each student is registered as a regular student at one of the three universities and has a Phase I adviser at the same university.

Phase I requires students to successfully complete five basic courses and at least two advanced courses, including a seminar. The BMS basic course programme is held in English and is coordinated between the three universities. Students are expected to attend the MATH+ Friday Colloquia regularly.

At the end of Phase I, students have to pass an oral "Qualifying Exam" in order to continue on to Phase II. Phase I students must also use Phase I to find a supervisor for their dissertation research in Phase II. Attending more than the one mandatory seminar is a good way to get to know professors and their research, to find out what the open questions in the field are and whether a professor is willing to take on a new PhD student. Every student has the possibility to earn an MSc at the end of Phase I.

**Phase II** is the research phase of the BMS PhD programme. BMS doctoral candidates should take advantage of the many opportunities offered by Berlin's mathematics research environment, including: DFG Research Training Groups (RTG), International Max Planck Research Schools (IMPRS), etc.

- [The complete list of units](#)
- [A list of classes for each semester](#)
- [A timeline of the PhD process](#)

#### **MATH+ Fridays – Kovalevskaya Colloquium**

Each semester, MATH+ designates one of the [MATH+ Friday colloquia](#) as the [Sonia Kovalevskaya Colloquium](#). This lecture features female mathematicians who are invited to share their experiences as women in the field of mathematics. The lecture is preceded by an informal lunch for female students. This gives female students the opportunity to talk to an outstanding female mathematician about career paths and to exchange information about their experiences.

#### **Mentoring**

The [BMS mentoring programme](#) was developed to provide individual guidance to BMS students in both their academic and personal development.

#### **Soft Skills Seminars**

The BMS offers [soft skills seminars](#) in order to help students develop the necessary skills for a career in mathematics, in academia or in the private sector.

#### **Support for Students with Children**

BMS provides additional support for students with children and students who are pregnant.

#### Types of assessment

Oral or written exams

The BMS Qualifying Exam at the end of Phase I is an oral exam.

#### International elements

- International guest lecturers
- Language training provided
- Training in intercultural skills
- Study trips

#### Description of other international elements

##### MATH+ Fridays

The MATH+ Friday colloquium (MATH+ Friday) is a lecture series given by distinguished mathematicians from all over the world. Each speaker explains how their research fits into the mathematical landscape in general, remarks on open problems, and demonstrates applications and analogies in other fields of mathematics and beyond. The aim is to offer a broad overview of a specific research area to enable everyone in the audience to grasp the main concepts involved.

#### Integrated internships

Phase I students can participate in the exchange programmes offered by [Freie Universität Berlin \(FU\)](#), [Humboldt-Universität zu Berlin \(HU\)](#) or [Technische Universität Berlin \(TU\)](#). Research visits can be arranged individually for Phase II students.

#### Teaching/work obligations or opportunities

There are teaching opportunities at all three participating universities. Depending on language skills and mathematical background, teaching experience can be gained as a tutor in undergraduate or graduate courses.

#### Special promotion / funding of the programme

- DFG (e.g. Research Training Groups)

#### 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

FU Berlin: 312.89 EUR  
HU Berlin: 315.64 EUR  
TU Berlin: 307.54 EUR

#### Costs of living

Please have a look at our BMS Guidebook, chapter 5.7 "Cost of Living" (page 26) at: <http://www.math-berlin.de/images/guidebook.pdf>

#### Funding opportunities within the university

Yes

#### Description of the above-mentioned funding opportunities within the

The BMS offers scholarships for both Phase I and Phase II students. Scholarships are funded under the "Excellence Strategy" of the German Science Foundation, DFG, and by the three Berlin universities: FU Berlin, HU Berlin and TU Berlin. Phase I scholarships are usually granted for 18

## university

months (extendable by six months), and amount to 1,000 EUR per month, tax free (no insurances included). Phase II scholarships are typically granted for 24 months (extendable by 12 months), and usually amount to 1,468 EUR, tax free (no insurances included).

For further information, go to: <http://www.math-berlin.de/students/financing-your-phd>

Extra childcare funds are reserved for BMS students with children.

For further information, please see: <http://www.math-berlin.de/students/for-student-parents>

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## Requirements / Registration

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### Academic admission requirements

Bachelor's degree (or equivalent) in mathematics (or equivalent) for [Phase I](#), Master's degree (or equivalent) in mathematics (or equivalent) for [Phase II](#)

#### [Application information](#)

First, download our [BMS PhD application guidelines](#) and read them thoroughly **before** beginning the online application process.

### Language requirements

Applicants must provide proof of their English skills with one of the following certificates:

- TOEFL minimum of 550 (paper-based test), 213 (computer-based), 79 (Internet-based)
- IELTS minimum of 6.5
- CPE minimum level C
- CAE minimum level C

<https://www.math-berlin.de/application/faqs/standard-tests>

### Application deadline

The **first-round application deadline of 1 December 2021** is for

- phase I applicants requiring **admission with a scholarship** and
- phase II applicants who will have earned a Master's degree by 31 March 2022 and want to start before October 2022.

The **second-round application deadline of 1 April 2022** is for

- phase I applicants requiring admission only and
- phase II applicants who will have earned a Master's degree by 30 September 2022 and want to start in October 2022.

### Submit application to

[BMS online application portal](#)

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## Services

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### Possibility of finding part-time employment

There are teaching opportunities at all three participating universities. Depending on language skills and mathematical background, teaching experience can be gained as a tutor in undergraduate or graduate courses.

[TU Berlin](#)

[FU Berlin](#)

[HU Berlin](#)

### Accommodation

Due to various factors, including the increasing number of immigrants, international students, as well as the increase in mobility of the population in general, the housing situation in Berlin has become very competitive. Since there is no campus accommodation in Berlin, we recommend

beginning your search for private accommodation as early as possible!

Affordable accommodation will relieve the strain on a student budget enormously. Rent is the largest monthly expense for students, on average about 450 EUR per month for a single room. However, the amount of rent depends mainly on the type of accommodation and where it is located.

#### Student Accommodation for BMS Students

Each year, ten rooms in the student village “**Studentendorf Schlachtensee**” are offered exclusively to new BMS students. Each room is fully furnished with a bed, bedlinen, cupboards, shelves, a desk and a chair. Shared bathrooms and kitchens are fully equipped. Available on-site is a free gym, music rooms, study rooms, a launderette, a supermarket and a student-run bar. The rental period is fixed for one year and starts on 1 September and ends on 31 August. This offer is available on a "first come, first serve" basis.

For more information, please have a look at our **BMS Guidebook**, chapter 5.6 "Accommodation" (from page 24 to 26).

Students who receive DAAD scholarships can apply for student accommodation via the **DAAD**.

**Structured research and supervision**

Yes

**Research training / discussion**

Yes

**Career advisory service**

**FU Berlin:** <http://www.fu-berlin.de/en/sites/career/index.html>

**HU Berlin:** <https://www.hu-berlin.de/de/career-center>

**TU Berlin:** [http://www.career.tu-berlin.de/menue/if\\_career\\_service/parameter/en/](http://www.career.tu-berlin.de/menue/if_career_service/parameter/en/)

Once a year, the BMS offers a "Meet the BMS Alumni" event or a "Career Day" for our BMS students.

**Specific specialist or non-specialist support for international students and doctoral candidates**

- Buddy programme
- Welcome event
- Cultural and linguistic preparation

**Support programmes for international students**

The One-Stop Office supports BMS students in various administrative issues ranging from travel, visa, housing, and bureaucratic issues, to language courses, child care, and music and sports opportunities. In September, around four weeks before the first semester begins, the BMS offers a German as a Foreign Language course to support those international students with little or no German language skills. In October, one week before the winter semester lectures begin, the "BMS Orientation" takes place. This five-day schedule of activities is designed to welcome new students to the BMS and to provide an opportunity for the One-Stop Office staff to offer them assistance with university registration. It also aims to provide the new students with the opportunity to learn about their new place of study and for them to get to know the other students. Orientation activities also include intercultural training and a walking tour of Berlin.



Berlin Mathematical School / Kay Herschelmann

**Giulia C.**  
MSc

„I was really excited to have the chance to join the BMS family for Phase II! In this past year and a half, I’ve experienced more of what the BMS has to offer: workshops to help learn to navigate PhD life, the "What is..." seminars in which topics from all over the mathematical spectrum are introduced by and for students; wine and cheese parties; board games; and most importantly, a welcoming and diverse mathematical community.“

## Our Partners



## Students and Alumni Talk About the Berlin Mathematical School

Students and alumni talk about the Berlin Mathematical School in this video.

» more:  
<https://www.youtube.com/watch?v=njRgZ4pgFqA>

# Technische Universität Berlin



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Information about the three Berlin universities FU, HU & TU:

**Freie Universität Berlin (FU Berlin)** was founded in 1948 by professors and students in response to the persecution faced by students who took a critical view of the system at the Universität Unter den Linden, which was located in the Soviet sector of the divided city at that time. The idea of the foundation of a free university attracted widespread support, including financial aid, from the international community. This helped pave the way for FU Berlin to become a university with an outstanding international reputation. Since the founding of the university, its academic ethos has always been defined by three values: truth, justice, and freedom.

The [FU Berlin](#) has approximately 30,000 undergraduate students in 178 degree programmes (WS 2020/21). Thirteen percent of students in Bachelor's degree programmes and 28% of students in Master's degree programmes come from outside Germany, as do 36% of its 4,000 doctoral students (as of 2020). The university is made up of eleven departments, one joint medical school with HU Berlin and three central institutes. Most of its facilities are located in the leafy residential district of Dahlem, south-west of Berlin.

[Institute of Mathematics](#)

[Humboldt-Universität zu Berlin \(HU Berlin\)](#), founded in 1810 by the liberal Prussian educational reformer and linguist Wilhelm von Humboldt, is Berlin's oldest university. The foundation concept put forward by Humboldt envisaged a "universitas litterarum", which would achieve a unity of teaching and research as well as provide students with an all-round humanist education.

Today [HU Berlin](#) is a public university offering more than 185 degree courses to over 36,222 (excluding Charité) students, almost 58% of whom are female students and 17% of whom are international (as of October 2020). The university is made up of nine faculties, three central institutes, five central units and five interdisciplinary centres. The natural science institutes of the HU are located at Adlershof in the south of Berlin.

[Institute of Mathematics](#)

[Technische Universität Berlin \(TU Berlin\)](#) was founded in 1879 as the result of a merger between the School of Architecture (est. 1799) and the Academy of Trade (est. 1821). It was closed at the end of World War II and re-established under its current name in 1946. Although it was Germany's first technical university, its educational mission was reallocated post-WWII to include an emphasis on "universal education". By including the humanities in its compendium of subjects, the TU became the first technical university in Germany to present a humanistic element in its scholastic profile.

[TU Berlin](#) has approximately 34,000 students, 33% of whom are female and 25% of whom are international (as of 2020). The seven faculties offer 140 degree courses, and the main campus is located in the district of Charlottenburg.

[Institute of Mathematics](#)



## University location

[Berlin](#) is Germany's capital city and a major centre of European politics, culture, media and science. It also serves as a continental hub for air and rail transport. The city's economy is primarily based on the service sector, which encompasses a diverse range of creative industries, media corporations, environmental services, congress, and convention venues.

Berlin is [the third most visited tourist destination](#) in the EU and home to world-renowned universities, research institutes, sporting events, orchestras, museums and media personalities. Its urban landscape and historical legacy has also made it a popular setting for international film productions. Recognised for its festivals, contemporary architecture, nightlife and avant-garde arts, Berlin has evolved into a focal point for individuals attracted by its liberal lifestyle, modern "zeitgeist" and low-cost living. It is home to 3.7 million people from over 190 countries.

First documented in the 13th century, Berlin was successively the capital of the Kingdom of Prussia (1701-1918), the German empire (1871-1918), the Weimar Republic (1919-1932) and the Third Reich (1933-1945). After World War II the city was divided: East Berlin became the capital of the GDR (East Germany) while West Berlin remained a West German enclave surrounded by the Berlin Wall from 1961-1989. It was possible for people from the west to go to the east, but only through strictly controlled checkpoints. For most East Germans, travel to West Berlin or West Germany was no longer possible. In 1971, the "Four Power Agreement on Berlin" (drawn up by the wartime allies France, UK, USA and USSR) re-established ties between the two parts of Berlin, improved travel and communications, and brought numerous improvements for the residents of the Western Sectors.

In 1989, pressure from the East German population brought the transition to a parliamentary democracy in East Germany. When the Berlin Wall fell on 9 November 1989, its citizens gained free access to the west. In Friedrichshain, a 1.3 km stretch of the Berlin Wall, known as the East Side Gallery, has been preserved as an international memorial for freedom. On 3 October 1990, East and West Germany reunited and became the Federal Republic of Germany. Berlin became the German capital in accordance with the unification treaty. The German parliament and government moved from Bonn back to Berlin in 1999.

Berlin is divided into twelve districts (Bezirke), each district is subdivided into a number of sub-districts (Ortsteile), and Berlin consists of 95 such sub-districts. In the past these areas were independent towns, villages and rural communities, and some of the subdistricts in Berlin are now known as a "Kiez". A term with a positive connotation, the word is of Slavonic origin and refers to a settlement. Its inhabitants often identify with the "Kiez" they live in. A Berliner "Kiez" usually consists mainly of pre-war buildings and upholds its own commercial and cultural infrastructure. Some of the more well known ones are the "Akazienkiez" in Schöneberg, the "Körnerkiez" in Neukölln and the "Kollwitzkiez" in Prenzlauer Berg.

[Berlin Tourist Information](#)  
[City Information in English](#)



# Contact

## Technische Universität Berlin

Berlin Mathematical School

Institut für Mathematik

Sekr. MA 2-2

Strasse des 17. Juni 136

10623 Berlin

✉ [office@math-berlin.de](mailto:office@math-berlin.de)

🌐 Course website: <http://www.math-berlin.de/academics/courses>

📘 <https://www.facebook.com/BerlinMathematicalSchool/>

🐦 <https://twitter.com/berlinmath>

🌐 <https://de.linkedin.com/company/berlin-mathematical-school>

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# International Programmes in Germany - Database

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## Editor

DAAD - Deutscher Akademischer Austauschdienst e.V.  
German Academic Exchange Service  
Section K23 – Information on Studying in Germany  
(responsible: Esther Kirk)  
Kennedyallee 50  
D-53175 Bonn  
[www.daad.de](http://www.daad.de)

## 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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