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Materials Science and Simulation • Ruhr-Universität Bochum • Bochum....................................................... 2
# Master's degree

**Materials Science and Simulation**  
**Ruhr-Universität Bochum • Bochum**

## Overview

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<td><strong>Degree</strong></td>
<td>Master of Science (MSc)</td>
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<td><strong>Teaching language</strong></td>
<td>English</td>
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<td><strong>Languages</strong></td>
<td>Participants can choose to write the Master’s thesis in either English or German.</td>
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<td><strong>Programme duration</strong></td>
<td>4 semesters</td>
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<td><strong>Beginning</strong></td>
<td>Winter semester</td>
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<td><strong>More information on beginning of studies</strong></td>
<td>October</td>
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<td><strong>Application deadline</strong></td>
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  - Non-EU applicants: 15 March and 15 June for the following winter semester (we offer two deadlines with regard to different visa procedures)  
  - EU applicants: 15 September 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**  
Students will obtain a comprehensive knowledge of materials science, physics and numerical methods. In particular, successful students will develop a profound knowledge and practical experience in applying advanced numerical and experimental methods on all the length and time scales that are relevant for materials. Thus, the Master's course will prepare excellent young scientists for successful careers in industry and academia. The curriculum was set up and will be continuously revised in co-ordination with the ICAMS industrial partners, ensuring to maintain the programme’s high standards in meeting the demands of current and future developments in research and industry.  
Throughout this course, students acquire a basic knowledge in advanced experimental and numerical methods in materials science and engineering. In optional and specialisation lectures, the students can widen their outlook and deepen their basic knowledge on current challenges in materials sciences. They also have the possibility to gain practical experience by participating in research projects. Thus, they will gain hands-on experience with state-of-the-art numerical and experimental methods and develop the competences and skills required for problem solving.
# Course Details

## Course organisation
The two-year, four-semester programme comprises basic and compulsory lectures imparting a thorough, science-based understanding of the behaviour of engineering materials of all kinds. In the first semester, students with different backgrounds have the possibility to acquire the basic knowledge they need to successfully participate in this Master’s course, like solid state physics for engineers or materials technology for physicists. These basic lectures are composed individually taking the specific background experience of students into consideration.

In the second and third semester, students attend compulsory courses that focus on the basics in materials science, microstructure-property relations, solid state physics, thermodynamics and materials processing and numerical modelling. As part of their specialisation, students select further optional lectures of their interest from the fields of modelling and simulation, and processing and characterisation.

In the final semester, students prepare their Master’s thesis. Supported by a mentor, they work on a scientific project and compile their research results in a final report. Throughout the Master’s course, students attend lectures in professional key competences (soft skills).

### Types of assessment
- Written examination
- Oral examination
- Seminar contribution
- Report
- Oral presentation
- Written essay
- Project
- Practical examination
- Colloquium lectures

### A Diploma supplement will be issued
- Yes

### International elements
- International guest lecturers
- Specialist literature in other languages
- Language training provided
- Study trips
- Projects with partners in Germany and abroad

### Integrated internships
- It is not obligatory to do an internship but it is possible to integrate it in the third semester of study
- Students have the opportunity to apply for a LabExchange programme grant (duration: two weeks, max. four months). LabExchange helps students conduct short-term research at a partner university abroad, e.g. lab, and research internships, research in archives, libraries and university collections, collaboration in research projects, etc.

### Course-specific, integrated German language courses
- Yes

### Course-specific, integrated English language courses
- No

### The course of study can be taken entirely online
- No

### Digital learning and teaching modules
- Chats with lecturers
- Moodle courses, e-books
Description of e-learning elements

- Course and examination preparation
- Supporting course material
- Submission and evaluation of written reports
- General and course specific announcements
- Course registration

Participation in the e-learning course elements is compulsory

No

Can ECTS points be acquired by taking the online programmes?

No

Can the e-learning elements be taken without signing up for the course of study?

No

Costs / Funding

Tuition fees per semester in EUR

None

Semester contribution

Social fee of approx. 330 EUR per semester, including a semester ticket covering public transport in the entire state of North Rhine-Westphalia

Costs of living

Minimum of 720 EUR per month to cover personal and living expenses

Funding opportunities within the university

Yes

Description of the above-mentioned funding opportunities within the university

Students with outstanding academic performance who are involved in special social activities can receive 300 EUR per month for a year from the Ruhr-Universität Scholarship Fund “Deutschlandstipendium”: http://www.rub.de/bildungsfonds/info-studierende/en/index_en.html

International students with good to very good academic performance who need financial support during the final phase of study can receive a graduation grant of 400 EUR per month for four months from the International Office at RUB:

http://international.rub.de/rubiss/finanzielles/iostipendium.html.en

Requirements / Registration

Academic Admission Requirements

- A Bachelor’s (BSc) or comparable degree in one of the following or related disciplines: materials science, mechanical engineering, physics, civil and environmental engineering, electrical engineering, chemical engineering, power engineering, chemistry, nanotechnology, mathematics, computer sciences or astronomy
- Adequate English language skills
- Academic achievement in the following subjects is required: material sciences, solid-state physics, physical chemistry or related subjects and in mathematics, numerical mathematics advanced programming language or other comparable subjects. For further details, please see the programme’s website.
Students who have failed to pass any degree in the above-mentioned disciplines cannot apply for the Master’s programme.

The examination board of the Master's course is entitled to raise further requirements in individual cases.

### Language requirements

**Proof of English language skills:**

- Native English speaker
- TOEFL: minimum score 550 points paper-based, 215 computer-based or 79 Internet-based; the TOEFL score must be sent to us directly from ETS after acceptance to the programme; institution code: 3580
- IELTS: minimum score 6.0; the IELTS score must be sent to us directly from the testing centre after acceptance to the programme
- Certificate proving that English has been language of instruction during the Bachelor’s programme

### Application deadline

**Non-EU applicants:** 15 March and 15 June for the following winter semester (we offer two deadlines with regard to different visa procedures)

**EU applicants:** 15 September for the following winter semester

### Submit application to

Applications can only be submitted online via the MSS-website.

**MSS online application**

### Services

#### Accommodation

Bochum has an abundance of affordable and pleasant accommodations. On average, students in Bochum pay approx. 330 EUR for their own apartment, which lies below the average rent in Germany. A room in a shared apartment is usually available for a mere 250 EUR.

About 5,000 students in Bochum live in 18 student halls close to the campus run by Akademisches Förderungswerk (AKAFÖ). There, they either have their own room, which includes a bathroom and shared kitchen, or they share an apartment with one or several housemates.

More information and online applications for accommodation can be found at [http://www.akafoe.de](http://www.akafoe.de).

In addition, eight private and church-affiliated student halls accommodate up to 1,000 students: [http://www.wohnheime-bochum.de](http://www.wohnheime-bochum.de)

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

- Welcome event
- Specialist counselling
- Visa matters
Situated in the centre of the dynamic and hospitable Ruhr metropolis in the heart of Europe, Ruhr-Universität Bochum is one of Germany’s largest universities, with a student population of over 43,000. Twenty departments offer around 180 courses that cover a broad spectrum of natural and social sciences, economics, medicine, engineering and humanities on a single campus. With excellence in both research and teaching, Ruhr-Universität has truly earned its reputation as an innovator. In the 1960s, the university was the driving force behind the Ruhr region’s industrial transformation from mining and manufacturing to high-tech and services. International research, an interdisciplinary academic approach, and favourable study conditions attract more than 5,600 foreign students and some 500 visiting scholars from all around the globe to Ruhr-Universität.

Four reasons to study in Bochum:

- international and multidisciplinary research
- more than 100 innovative degree programmes and a unique range of subject combinations
- excellent services for international students and researchers
- located in the metropolitan Ruhr region in the middle of Europe, with a unique range of cultural and leisure activities available nearby

University Location

Bochum, a very lively modern city with around 370,000 inhabitants, is situated in the heart of the Ruhr area. This area is a metropolitan region with a population of around five million, close to the Dutch, Belgian, and French borders. The region has one of the highest concentrations of institutions of higher education and research in Europe as well as a very rich cultural life with many theatres, concert halls, cinemas, and museums. There are also many opportunities to discover the living history of industrial culture in and around Bochum, and there are many places to unwind and relax in the green belts south of the city.
Contact

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