Photo: Marek Kruszewski/TU Braunschweig

International

Our profile is international: TU Braunschweig is a cosmopolitan university. We cooperate closely with universities in the European Union, the USA, Canada, South America, China and Japan. Through the ERASMUS programme, we have student exchange partnerships with more than 200 universities in Europe.

One third of all our students spend part of their studies outside of Germany. **Dual degrees** with US, French, Brazilian and Chinese universities qualify our graduates for the international job market. Student exchanges, research projects and internships in foreign countries allow them to gain invaluable international experience. The various language courses on offer at our Language Centre prepare them for their stays abroad and for future careers in international environments.

International students are an important part of our academic community. Our campus is truly diverse: 3,000 students from 120 countries are currently studying and researching at TU Braunschweig. The excellent support provided by the International Office, the City of Braunschweig and the Peer Student Programme ensures that international students feel at home at our university.

In terms of research, our international orientation is just as self-evident. A considerable number of international scientists teach and conduct research at TU Braunschweig.

Life on Campus

Campus life has a lot to offer. More than 80 **student initiatives** offer a chance to find like-minded friends and get involved in technical projects, sports, social activities and university politics. The options cover everything from building race cars and self-driving model cars for competition with other German universities, to student business consultancies and engineering offices.

If you are looking for a **cultural pastime**, you are spoilt for choice at TU Braunschweig: our university orchestra, the TU Choir, the big band and our wind instruments group "akablas" are all vying for the most talented musicians on campus. Alternatively, why not join one of the theatre groups?

At the gymnasium or the campus fitness centre, on the beach volleyball courts, in the sauna, or even sailing or parachuting – with more than 200 classes per week in 90 sports, we offer the broadest **sports programme** in the region.

The **Haus der Wissenschaft** (House of Science) offers all types of events in an open and creative atmosphere and invites both amateurs and expert to think and speak about their conceptions of science, technology, and culture.

TU Braunschweig pays special attention to its **students and employees with children**. Two childcare centres are available at the central campus, and the Office for Family Affairs and a network for dual-career couples further supplement this service. TU Braunschweig has been awarded the "Family-friendly University" certificate for its commitment in this area.

Our annual night-time campus festival **"TU NIGHT"** regularly attracts some 20,000 visitors who get to enjoy hands-on science. More than 1,500 kids attend our children's university. And with more than 1,000 public events each year, we are the scientific and cultural focal point of the region.

Under the motto **"Check-in – Discover Science!"**, we offer secondary school students a chance to breathe university air, with some 40 options in various subject areas to choose from.

We receive special recognition from various foundations, companies and private individuals who support our students, for example with a Germany Scholarship or by financing awards for junior scientists. The **Carolo-Wilhelmina Foundation**, the only one of its kind in Lower Saxony, improves the conditions for teaching and studying and offers help to those of our students who find themselves in difficult situations.

Photo: Marek Kruszewski/TU Braunschweig

TU Figures

Range of courses: 75 subjects, including:
- 28 bachelor's degree courses and state examination courses (for undergraduates)
- 40 master's degrees from 6 departments

Students: 20,116 in the 2017/18 winter semester, including:
- 7,690 women
- 2,957 international students from 118 countries
- 4,570 first-term under- and post-grad students, including 2,617 freshers
- 12,233 students in engineering
- 3,923 students in natural sciences
- 3,960 students in humanities, education and social studies

Graduates: 3,155, including 1,301 women
Doctorates: 298, including 106 women

Staff: 3,684 university employees (1,517 women), including externally funded employees:
- 241 professors (48 women)
- 1,981 scientific staff (610 women)
- 1,359 technical and administrative staff (824 women)
- 103 trainees (35 women)
- plus 409 (paid) lectures (173 women)
- plus 2,279 student and research assistants (820 women)

Finances: overall budget of € 335 million, including:
- € 90.8 million in external funding

History

1745: The Collegium Carolinum is established, a new type of educational institution between secondary school and university, where mathematical/technical subjects are taught alongside humanities and fine arts.
1878: The polytechnical school is renamed Herzogliche Technische Hochschule Carolo-Wilhelmina (TH).
1900: The TH is accredited to award doctorates.
1933: Political alignment of the TH: the institution loses nearly 20% of its academic staff during the early period of the Nazi regime.
1945: Despite 70% of the institution being destroyed, the TH resumes lectures. It is the first German technical university to do so.
1968: After the establishment of a department for humanities and social sciences, the TH is renamed Technische Universität or TU (Institute of Technology).
2003: Establishment of the Centre for Humanities and Social Sciences at the Northern campus.

In 1932, Agnes Pockels (1862-1935) was the first woman to receive an honorary doctorate from TH Braunschweig. Self-taught with no formal training, she discovered important fundamental principles in the field of surface and interfacial tension.
Photo: Kristina Rottig/TU Braunschweig

2006: Creation of TUg, an association of the nine leading German Institutes of Technology.
2007: Braunschweig is named the "City of Science 2007".
2007: Foundation of the Automotive Research Centre Niedersachsen (NFF).
2009: Foundation of the Aeronautics Research Centre Niedersachsen (NFL).
2009: Creation of the Braunschweig Integrated Centre of Systems Biology (BRICS).
2012: Creation of the Centre for Pharmaceutical Process Engineering (PVZ).
2013: Establishment of the Laboratory of Emerging Nanometrology (LENA).
2016: Completion of the Open Hybrid LabFactory research campus.
2016: Inauguration of the Masch.Bau students' building.
2017: Record high of 20,116 students.
2018: Relocation to the new Laboratory of Emerging Nanometrology (LENA).

Braunschweig-born mathematician Carl Friedrich Gauß (1777-1855) studied at the Collegium Carolinum for three years.
Photo: Kristina Rottig/TU Braunschweig

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Technische Universität Braunschweig

Short Portrait

Technische Universität Braunschweig

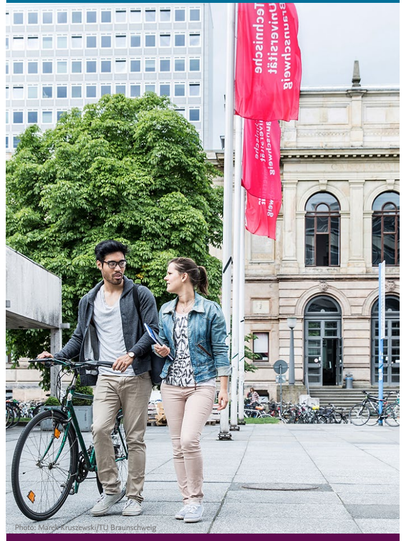

Photo: Marek Kruszewski/TU Braunschweig

www.tu-braunschweig.de

Carolo-Wilhelmina

Technische Universität Braunschweig Carolo-Wilhelmina is the academic focal point of Braunschweig, the City of Science, which in turn is at the heart of one of Europe's most active research regions. With more than 20,000 students and 3,700 staff members, we are the largest Institute of Technology in Northern Germany. Our campus is the ideal size for a university: our vast spectrum of teaching and research activities enjoys the use of state-of-the-art facilities while offering an intimate atmosphere at the same time. The Central Campus is located on the banks of the Oker River, walking distance from Braunschweig's city centre.

Our core disciplines include a comprehensive engineering branch and a strong natural sciences branch, closely linked to business sciences, social sciences, humanities and educational sciences. Our strategic research fields are mobility, infections and active agents, the city of the future and metrology, which are interconnected through numerous overarching topics.

The name Carolo-Wilhelmina stems from the founding fathers of Technische Universität Braunschweig, Dukes Carl and Wilhelm von Braunschweig-Lüneburg. In 1745, Carl founded the Collegium Carolinum, thus becoming the first in Germany to lay the foundations for a technical university. Among the first students was mathematician Carl Friedrich Gauß.

Nec aspera terrent ("Adversities shall not deter us"): this motto of the founders of our university still serves as our maxim.

With its 250,000 residents, **Braunschweig** is the largest city between Hanover and Berlin, making it the region's focal point, both throughout history and the present. Today, the Lion City is characterised by its rich history, its continuous development as a dynamic economic and commercial hub, its diverse and attractive cultural life, and its many-faceted research and science landscape.

At the NFL aeronautics centre, basic research is conducted on model jet engines to make future aircraft quieter and more efficient. Photo: Sebastian Olschewski/TU Braunschweig

Studying and Teaching

Study at the cutting edge of science: our courses are guided by our research and impart broad, in-depth fundamentals, as well as offering diverse possibilities for individual specialisation. We let our students experience what it is like to put their own thoughts and results into practice, to research and develop projects on their own. For this reason we try to shape our degree courses around up-to-date research topics from an early stage.

In interdisciplinary courses such as Environmental Science or Biochemical and Pharmaceutical Engineering, Transportation Engineering, Sustainable Energy Engineering and Biotechnology, as well as classic subjects from the fields of engineering, natural sciences, humanities and social sciences, our curriculum aims to interlink the various individual fields of study. Many courses of study are developed and realised in conjunction with neighbouring research institutes, such as the Metrology and Analytics course that is unique in Germany and is offered in cooperation with the German metrology institute PTB.

Master's degree: our goal is for our bachelor's graduates to continue to study at the master's level. Here the focus is even stronger: all our master's programmes are research-oriented and provide the necessary skill sets for management positions and international careers in research, development and business management.

Awards for exceptional teaching: we strive to continuously improve the quality of our teaching through student participation and by encouraging digital innovation in particular. The best courses are awarded the "LehrLeo" teaching prize.

Open University: we open up new possibilities by offering students the chance to study without holding an "Abitur" certificate. We also practice knowledge transfers through research-oriented further education, especially in the field of mobility.

Technische Universität Braunschweig is part of the TU9 group of leading Institutes of Technology in Germany, and for each of its core disciplines, the engineering subjects, it ranks among the top 9 universities in Germany.

At the BRICS systems biology centre, laser microscopes are used to develop molecular diagnostics methods intended for use in medicine. Photo: Frank Bierstedt/TU Braunschweig

Research

Fuel-efficient or electric light-weight vehicles suitable for serial production, quiet, low-emission aircraft, therapeutics for combating infectious diseases, personalised medications, metrology for nanotechnology, or strategies for the interlinked city of the future: by focussing our research activities in these areas, we are able to make significant contributions to the great challenges facing society today. To reach this goal, we cooperate closely with the internationally renowned research facilities in Braunschweig.

At TU Braunschweig, we are working on the hot topic of **sustainable mobility** – covering everything from automotive to aerospace and rail technology. The Automotive Research Centre Niedersachsen (NFF) is one of the leading interdisciplinary **centres for automotive and traffic research** in Europe. Partners from other universities, non-university research facilities and the industry are closely involved. At our Wolfsburg site, the Open Hybrid LabFactory has become a hub for the development of new light-weight concepts suitable for mass production. Our broad range of research topics includes intelligent cars, sustainable and energy-efficient production processes for light-weight, fuel-efficient vehicles, as well as electromobility.

Developing fundamental technologies for setting the course for an **energy transition in aviation** is a key research project of the Aeronautics Research Centre Niedersachsen (NFL). The aim is to

The full-vehicle simulator at the NFF automotive centre enables research not only on vehicle control systems, but also on new driver assistance features and self-driving functionalities. Photo: Christian Bierwagen/TU Braunschweig

reduce emissions and noise pollution. One focal point is the development of various concepts for active high-lift systems for future commercial aircraft. The Centre is a joint project of TU Braunschweig and German aeronautics centre DLR and pools competencies from all across Niedersachsen at the Braunschweig Research Airport.

The Central Campus's BRICS research centre combines natural sciences, engineering and information technology to produce high-powered **systems biology.** Working with colleagues from the Helmholtz Centre for Infection Research and the Leibniz Institute DSMZ (German Collection of Microorganisms and Cell Cultures), BRICS researchers develop strategies for combating infectious microorganisms. This includes natural substances consisting of microorganisms. The manufacturing and processing of these agents is the subject of the research branch of **pharmaceutical process engineering.**

Materials and components measuring only millionths of a millimetre have become indispensable in many procedures. Their measurement is a challenge that requires new approaches in **nano-metrology,** including a determination of the limits of what can be measured. The LENA research centre, which collaborates with German metrology institute PTB, is dedicated to this field of research.

We are developing comprehensive concepts for the **intelligent cities of the future** in order to fulfil the complex demands of urbanisation. We aim to find solutions that will contribute to efficient, eco-friendly, healthy, social and green Smart Cities.

Active research region

Braunschweig is not only one of the most active research regions in Europe: according to European Union statistics, it is also one of Europe's top investment regions in terms of spending on research and development. German economics magazine "Wirtschaftswoche" has also ranked Braunschweig among the top business friendly cities. TU Braunschweig plays a substantial part in this as it serves as a vital engine for the region. Our students are able to take part in projects at the facilities of our cooperation partners, for example at the Helmholtz Centres, Fraunhofer and Leibniz Institutes, and at federal research facilities and museums. Here they gain hands-on experience in biotechnology and environmental technology, automotive technology, aerospace technology, information and communications technology, measurement technology and microelectronics, as well as in humanities and education.

Transfers: what does it take to turn a good idea into a successful business concept? Technology transfers help to bring our research results to the economy, give support to business founders, and protect inventions through patenting. Under the roof of the Innovationsgesellschaft iTUBS (TU Braunschweig's innovation company), various specialised technology transfer centres aim to provide access to TU Braunschweig's research potential for commercial use, including for small and mid-sized enterprises.

Transparency and solid foundations: as a technical university, we seek open exchanges with the economy and society. In doing so, we also retain our independence. We feel an obligation towards a public, scientific and ethical discourse about the work that we do and uphold the rules of good scientific practice.