TECHNISCHE UNIVERSITÄT DRESDEN

TU DRESDEN AN OVERVIEW

Contents

image credit: Claudia Hecker

Welcome to Technische Universität Dresden –
one of eleven “Universities of Excellence” in Germany!

Here at TU Dresden – as we say for short – you will experience a unique combination of excellent research and teaching, in a city which is renowned throughout the country for outstanding partnerships between science and culture. As a “Synergetic University”, TU Dresden is characterised by cooperation – between the various disciplines at the university itself, and with numerous non-university research facilities in Dresden.

It is this “Dresden spirit”, paired with the highest expertise, which makes TU Dresden a sought-after partner for industry and other educational institutions. TU Dresden has already been successful in the first round of the German government’s “Excellence Initiative” to promote cutting-edge university research, securing the funding for a Graduate College and a Cluster of Excellence in the field of biomedicine and bioengineering. In the second round, this success was not merely repeated, but indeed exceeded, with confirmation for a further Cluster of Excellence in microelectronics as well as the Institutional Strategy.

TU Dresden has thus established itself as an excellent full-spectrum university, with a broad subject base and nationally and internationally acknowledged research competence. Please allow me to take you on a journey of discovery around the university!

Prof. Dr.-Ing. habil. DEng/Auckland
Dr. h.c./Brno Hans Müller-Steinhagen
Rector of TU Dresden

image credit: TU Dresden

Technische Universität Dresden is one of the most tradition-steeped and most dynamic universities in Germany. Indeed, it has belonged to the circle of eleven "Universities of Excellence" in Germany since 2012.
TU Dresden's long-standing reputation as a "technical" university is already reflected in its name. But the emphasis embodied in this name is at the same time something of an understatement, because TU Dresden has long since evolved into a full-curriculum university with 14 faculties organised into five schools. The second-largest field after the engineering sciences, which account for some 48 per cent of the students, is that of the humanities and social sciences with around 33 per cent, followed by the natural sciences (12 per cent) and medicine (7 per cent). The 36,000 students at TU Dresden are able to choose from more than 120 courses covering the full spectrum of scientific disciplines. In addition to its Bachelor and Master degree programmes, TU Dresden is one of the few universities in Germany which still offers modularised studies leading to a Diplom degree. International double-degrees are also offered in selected disciplines. A complete overview of the available courses can be found in the online Study Information System at http://tu-dresden.de/sins.

Furthermore, TU Dresden is among the small group of German universities which have implemented quality management systems to evaluate their teaching and study opportunities and to provide accreditation for the study programmes offered. Commitment to this system of accreditation underlines TU Dresden's drive not only for excellence in research, but also for excellence in teaching.

Driven by the goal of belonging to the international elite in the academic world, TU Dresden continues to pursue purposeful developments. A significant milestone was attained in 2012 when it was granted the status of a "University of Excellence". Within the framework of the so-called "Excellency Initiative" launched by the federal and state governments, special funding is acquired not only for the future-oriented concept of "The Synergetic University", but also for the work of two Clusters of Excellence – namely the Center for Advancing Electronics Dresden (cfaed) and the Center for Regenerative Therapies Dresden (CRTD) – and the Dresden International Graduate School for Biomedicine and Bioengineering (DIGS-BB).

Interdisciplinary and multifaceted

If you seek diversity, then TU Dresden is the place to be. True to the motto of TU Dresden: „Wissen schafft Brücken" – "Knowledge builds bridges", inter- and transdisciplinarity are the daily routine, and cooperation with extra-mural scientific and cultural institutions is common practice.
It is the declared objective of TU Dresden to provide an excellent academic home to up-and-coming scientists from both Germany and abroad. Implementation of this plan is dependent on the fulfilment of three prerequisites: excellent research, excellent teaching, and excellent framework conditions for said research and teaching. With the backing of federal and state funding amounting to around 60 million Euros, the individual measures of the "Institutional Strategy" are all geared towards bringing the university closer to this ambitious aim, and to drawing the world's leading scientists, staff and students to TU Dresden.

The performance capabilities of any institution are reliant on the people involved. Accordingly, the Excellence Strategy of TU Dresden revolves around one unambiguous focus: the people who work, teach, study and conduct research here.

The innovative and open application process for new professorship appointments, visiting scientist programmes, the graduate academy, new teams to promote and coordinate the acquisition of external funding, transfer of knowledge and synergy developments, organisation of the 14 faculties into five overarching schools, and a plethora of projects to improve structures and working procedures – all serve one goal: to support, strengthen and spread the reputation of TU Dresden as an exceptionally attractive university throughout Germany and the world.

International and cosmopolitan

For TU Dresden, international cooperation is an essential component of its self-image. Some 45,000 scientists and students representing 125 different nationalities are all members of the closely-knit campus family. In fact, the excellence status of TU Dresden would be inconceivable without its international students and staff. This development is to be further encouraged, and a dedicated strategy is pursued to promote internationalisation within the framework of the Excellence Initiative.

Theory meets practice

Like a magnet, TU Dresden attracts eminent institutes and global industry players to the city. The Max Planck Institutes, the Fraunhofer Gesellschaft and the Leibniz and Helmholtz Associations all maintain intensive contact to researchers at the university.
Their joint excellence is bundled in the research alliance "DRESDEN-concept", which was founded in 2009 and, by bringing together not only the aforementioned scientific institutions, but also the city's museums, acts as a motor for cooperative research and shared utilisation of the scientific infrastructure. Industry partners such as Siemens, SAP, Infineon, Globalfoundries or Thyssen-Krupp offer students opportunities to write dissertations in their companies or else to gather professional work experience. In addition, numerous companies have sponsored endowed chairs at the university. Networking among the countless contributors to research activities at and around the university is promoted and supported through a specifically mandated Transfer Office.

Innovation out of tradition

TU Dresden can look back over more than 185 years of science history. Ambitious goals and the courage to venture new paths were characteristic from the outset. Its founding fathers already aspired to transform visions into reality. It is hardly a coincidence that the world's first single lens reflex camera and the first steam locomotive in Germany were designed and built here. It is this same atmosphere of intellectual creativity which makes TU Dresden so attractive, and that not only for research: In 2003, TU Dresden was also one of the first major German universities to introduce a comprehensive eco-audit, a system to evaluate and improve environmental protection in its day-to-day activities. The university's academic potential, which is immediately evident from the first direct contact, is also confirmed in the most varied rankings. Dresden graduates are highly sought – after by employers.

Dresden – city of culture

"Florence on the Elbe", as Dresden is popularly known, offers an abundance of cultural highlights. The Semper Opera House, the Baroque Zwinger palace and the Frauenkirche church are internationally renowned. The art masterpieces in the city's museums are equally priceless; visitors flock to Dresden to admire Raphael's "Sistine Madonna" and the exhibitions of the Green Vault, the treasure collections of the Saxon electors. The lively modern scene comprises experimental theatres, art-house cinemas and a variety of galleries for contemporary art. And for all those interested in night-life, the scene district Dresden-Neustadt awaits with over 200 bars, clubs and restaurants. But simply experience it all for yourself - you are always welcome at TU Dresden.

image credit: Amac Garbe

Schools and Faculties

Even Greater autonomy, synergy benefits, interdisciplinarity, strategic opportunity: Guided by this vision, the 14 faculties of TU Dresden are reorganising themselves under the roof of five schools. Following the principle of subsidiarity, the objective is to uphold academic plurality while at the same time exploiting synergetic advantages in research, teaching and administration. The restructuring is to be accomplished in three phases: The first step, taken in May 2012, was to define the five schools to bracket the respective faculties. During the subsequent second phase, new administration units are to be established to represent the five schools and will be invested with functions and competencies previously held by the faculties or by departments of the central university administration. Upon successful implementation, the third and final phase will see the remaining faculty responsibilities transferred to the schools.

SCHOOL OF SCIENCE
https://tu-dresden.de/mn
Department of Biology
Botany, Genetics, Microbiology, Zoology, Molecular Biotechnology
Department of Chemistry and Food Chemistry
Inorganic Chemistry, Biochemistry, Food Chemistry, Macromolecular Chemistry, Organic Chemistry, Physical Chemistry and Electrochemistry, Analytic Chemistry
Department of Mathematics
Algebra, Analysis, Geometry, Mathematical Stochastics, Numerical Mathematics, Scientific Computing, Didactics of Mathematics
Department of Physics
Applied Solid-State Physics and Photonics, Electronic Properties of Solids, Structure of Condensed Matter, Nuclear and Particle Physics, Theoretical Physics, Didactics of Physics, Organic and Molecular Electronics, Soft Condensed Matter and Biophysics
Department of Psychology
Institute I: General Psychology, Biopsychology and Methods of Psychology
Institute II: Clinical Psychology and Psychotherapy
Institute III: Work, Organisational and Social Psychology
Institute IV: Educational and Developmental Psychology

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES
Faculty of Education
https://tu-dresden.de/ew
Institute of Education, Institute for Vocational Education, Institute of Social Education, Social Work and Community Welfare
Faculty of Law
https://tu-dresden.de/jura
Foreign and International Harmonisation of Law, European History of Law, Theory and Social Foundations of Criminal Law, Constitutional Law, International Law, European Law, UNESCO Chair in International Relations, Labour Law, Technology and Environment Law, Energy Law, Cartel Law, Telecommunications Law, Intellectual Property, Competition and Media Law, Taxation and Business Law, German-Italian Institute for Comparative Law Studies

Faculty of Arts, Humanities and Social Science
https://tu-dresden.de/phil
Philosophy, History, Art History, Musicology, Political Science, Protestant Theology, Catholic Theology (all including teaching qualification), as well as Sociology and Media and Communication.

Faculty of Linguistics, Literature and Cultural Studies
https://tu-dresden.de/slk
English and American Studies, German Studies (incl. German as a Foreign Language), Classical Philology, Romance Studies (French, Spanish, Italian), Slavic Studies (Russian, Polish, Czech)

Faculty of Business and Economics
https://tu-dresden.de/wiwi
Chairs in Business Administration, Chairs in Economics, Chairs in Business Informatics

SCHOOL OF ENGINEERING SCIENCES
Faculty of Electrical and Computer Engineering
https://tu-dresden.de/et
Acoustics and Speech Communication, Electronic Packaging Technology, Automation, Biomedical Engineering, Electrical Power Systems and High Voltage Engineering, Electrical Machines and Drives, Electromechanical and Electronic Design, Solid-State Electronics, Semiconductor and Microsystems Technology, Power Electronics, Measurement

image credit: Patric Hesse

and Sensor Systems, Communication Technology, Control Theory, Circuit Design, Electromagnetic Theory and Compatibility

Faculty of Computer Science
https://tu-dresden.de/inf
Applied Computer Science, Artificial Intelligence, Software and Multimedia Technology, Systems Architecture, Computer Engineering, Theoretical Computer Science

Faculty of Mechanical Science and Engineering
https://tu-dresden.de/mw
Aerospace Engineering, Fluid Mechanics, Fluid Power, Lightweight Engineering and Polymer Technology, Machine Elements and Machine Design, Machine Tools and Control Engineering, Manufacturing Science and Engineering, Material Handling and Industrial Engineering, Materials Science, Natural Materials Technology, Power Engineering, Process Engineering and Environmental Technology, Solid Mechanics, Textile Machinery and High Performance Material Technology, Centre for Energy Technology, Centre for Integrated Natural Materials Technology, Max Bergmann Centre of Biomaterials Dresden, Centre for Production Engineering and Controlling, Competence Centre for Technical Textiles, Centre of Virtual Mechanical Engineering

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING
Faculty of Architecture
https://tu-dresden.de/arch
Architectural History, Theory of Architecture and Monument Preservation, Theories of Design and Presentation, Building Climatology, Building and Design, Urban Design, Landscape Architecture, Structural Design, Building Construction and Design, Construction Economics and Computer-Assisted Design

Faculty of Civil Engineering
https://tu-dresden.de/bau
Construction Management, Construction Informatics, Construction, Construction Materials, Geotechnology, Concrete Structures, Mechanics and Shell Structures, Urban Engineering and Road Construction, Steel and Timber Construction, Structural Analysis, Hydraulic Engineering and Technical Hydromechanics

Faculty of Environmental Sciences
https://tu-dresden.de/uw
Department of Forest Sciences
Biodiversity and Nature Protection, Soil Science and Site Ecology, Forest Botany and Zoology, Forest Utilisation and Forest Technology, Forest Economics and Forest Management Planning, Wood and Plant Chemistry, Tropical Forestry, Forest Growth and Forest Informatics, Silviculture and Forest Protection
Department of Geosciences
Geodesy, Geography, Geoinformatics, Cartography, Photogrammetry and Remote Sensing, Planetary Geodesy

Department of Hydrosciences
Waste Management and Circular Economy, Groundwater Management, Hydrobiology, Hydrology and Meteorology, Urban Water Management, Water Chemistry

“Friedrich List” Faculty of Transport and Traffic Sciences
https://tu-dresden.de/vkw
Dresden Institute of Automobile Engineering, Railway Vehicles and Railway Technology, Railway Systems and Public Transport, Logistics and Aviation, Transport Planning and Road Traffic, Traffic Telematics, Transport and Economics

MEDICAL SCHOOL
Faculty of Medicine Carl Gustav Carus
https://tu-dresden.de/med
Anatomy, Occupational and Social Medicine, Health Sciences, History of Medicine, Immunology, Clinical Genetics, Clinical Pharmacology, Medical Informatics and Biometry, Medical Microbiology and Hygiene, Pharmacology and Toxicology, Physiology, Physiological Chemistry, Forensic Medicine, Virology, Molecular Diabetology, Medical Physics, Tissue Engineering, Medical Systems Biology, Cellular Imaging, CrispR/Cas9 Facility, Structural Cell Biology, OncoRay – National Center for Radiation Research in Oncology, DFG Research Centre for Regenerative Therapies Dresden – Excellence Cluster of TU Dresden

Dresden University Stroke Centre – DUSC, University Allergy Centre – UAC, University Cancer Centre – UCC, Gynaecological Cancer Centre at the University Cancer Centre, Skin Tumour Centre at the University Cancer Centre, Visceral Oncology Centre at the University Cancer Centre, Regional Breast Centre at the University Cancer Centre – RBZ, Centre for Familial Breast and Ovarian Cancer, Prostate Carcinoma Centre at the University Cancer Centre, University Pain Centre – USC, University Vascular Centre – UGC, University Centre for Evidence-Based Health Care, University Centre for Orthopaedics and Trauma Surgery, Centre for Translational Bone, Joint and Soft Tissue Research, University Palliative Care Centre – UPC, University Mucoviscidosis Centre – UMC, University Centre for Plastic Surgery – UPÄC, University Physiotherapy Centre, University Centre for Rare Diseases – USE, University Proton Therapy Facility, University Centre for Healthy Aging

Ear, Nose and Throat Medicine, Saxon Cochlear Implant Centre Dresden (SCIC), Phoniatrics and Audiology, Dermatology, Ophthalmology, Radiation Therapy and Radio Oncology, Nuclear Medicine, Neurology, Centre for Internal Medicine, Visceral, Thorax and Vascular Surgery, Surgery Research, Neurosurgery, Urology, Anaesthesiology and Intensive Therapy, Gynaecology and Obstetrics, Paediatric and Juvenile Medicine, Neuropaediatrics, Paediatric Surgery, Psychiatry and Psychotherapy, Child and Youth Psychiatry and Psychotherapy, Psychotherapy and Psychosomatics, Psychosocial Medicine and Developmental Neurosciences, Oral and Facial Surgery, Orthodontics, Dental Conservation, Paediadontology, Parodontology, Dental Prosthetics

Radiological Diagnostics, Neuroradiology, Pathology, Clinical Chemistry and Laboratory Medicine, Coordination Centre for Clinical Studies Dresden, Medical Interprofessional Training Centre

School of Science

The School of Science is a multidisciplinary school, comprising the departments of Biology, Chemistry and Food Chemistry, Mathematics, Physics and Psychology. In all its activities, it invariably strives to uphold the Humboldtian ideal of the unity of research and teaching. Both students and staff profit, from the outstanding research landscape in Dresden, with the Helmholtz Zentrum Dresden-Rossendorf, three Max Planck Institutes, two institutes of the Leibniz Association and numerous institutes of the Fraunhofer Gesellschaft. By applying this principle, the school lends active and multifaceted support to the implementation of the Institutional Strategy for the future at TU Dresden. The founding of the **Department of Biology** in 1994 proved the starting point for exceptionally dynamic and successful developments in Life Science studies at TU Dresden and across a plethora of non-university research facilities.

Numerous institutes have followed over the years, for example the Max Planck Institute of Molecular Cell Biology and Genetics, the Biotechnology Centre (BIOTEC) and the Max Bergmann Centre of Biomaterials. The most recent inaugurations have been the Cluster of Excellence "Center for Regenerative Therapies" and the Centre for Innovation Competence "B-Cube".

A broad range of teaching and the ultramodern infrastructures of the biology institutes and their partners create perfect study conditions for students, whether for Bachelor programmes in biology and molecular biotechnology or a Master programme in biology. The high level of student satisfaction is confirmed by the latest rankings. BIOTEC hosts the international Master programmes "Molecular bioengineering", "Nanobiophysics" and "Regenerative biology and medicine", to which professors from the Department of Biology also contribute. The same applies to the Dresden International Graduate School for Biomedicine and Bioengineering (DIGS-BB), a doctoral programme which is unique in Germany in the field of molecular cell biology and biotechnology.

Central topics of current research are drawn from the fields of molecular cell biology, (developmental) genetics, molecular bioengineering, and bio- and biomimetic materials. Further fields of activity are to be found in system biology, microbial systems/white biotechnology and the mechanisms of bioactive natural products. With this focus, Dresden is developing into a leading biotechnology hub of international renown.

The **Department of Chemistry and Food Chemistry** maintains close links to the relevant research institutes in and around Dresden. This integrated research and teaching concept enables students to become involved in cutting-edge research at the earliest possible stage. Key research interests are diverse topics from the field of nanotechnologies, e.g. the DFG Priority Programme 1362 "Porous metal-organic frameworks", and contributions to the Cluster of Excellence "Center for Advancing Electronics Dresden" (cfaed). The department's integrated German-French programme in chemistry has been successfully converted to the Bachelor and Master system. The formation of a network comprising the Universities of Stuttgart and Saarbrücken, TU Dresden, the École Européenne de Chimie, Polymères et Matériaux de Strasbourg (ECPM), an institute of the University of Strasbourg, and the École National Supérieure de Chimie de Rennes (ENSCR) has further enhanced the attractiveness of this study option.

The **Department of Mathematics** is characterised by a broad spectrum of research activities, with several ERC grants, DFG projects and contributions to the Clusters of Excellence, Collaborative Research Centres and graduate colleges. It is thus a central factor in various Research Priority Areas of TU Dresden, and the connecting element in numerous interdisciplinary projects. Two topics have emerged as focal themes for the Department of

image credit: Amac Garbe

Mathematics over the past few years: (1) Partial differential equations and their applications in the engineering and natural sciences, and (2) discrete structures and optimisation. Further pivotal fields are mathematical economics and didactics. Alongside a diversity of research projects, these particular interests are also reflected in the teaching offered to Bachelor, Master and doctorate students. They provide a foundation for broadly based and modern mathematical training and guarantee an attractive future career for our graduates.

One distinguishing quality of the **Department of Physics** is the strength of its experimental and theoretical research activities in the fields of solid-state physics, nuclear and particle physics, complex quantum systems and biophysics. Together with local institutes of the Leibniz Association, the Max Planck Society, the Helmholtz Association and the Fraunhofer Gesellschaft, the department forms an internationally renowned cluster for both fundamental and applied research in the fields of solid-state physics and materials science, the concentration of which is unique in the world. In applied physics, close links are maintained with private industry, as reflected in spin-off companies such as Novaled or Heliatek, which develop organic LEDs and solar cells. A similarly close relationship is cultivated with the Dresden Cluster of Excellence cfaed. In nuclear and particle physics, Dresden-based scientists are actively involved in the ATLAS experiment at the "Large Hadron Collider" (LHC) at CERN, and are in close cooperation with the Dresden Felsenkeller Laboratory to establish a globally unique facility for neutrino physics research.
According to the CHE (Centre for Higher Education) research rankings, the Department of Physics at TU Dresden is one of the top ten research performers in Germany and takes a pole position above all in the category of postgraduate studies, with around 70 doctorate degrees awarded each year. The teaching for both Bachelor and Master programmes conveys knowledge at the highest level – with an international orientation, fast degree completion and strong relevance to current research. In addition, physics teachers are trained for secondary and vocational schools, and the department is responsible for a non-consecutive, interdisciplinary Master course in "Organic and Molecular Electronics". Approx. 950 students are enrolled at the department, which also provides basic physics training for students in various neighbouring disciplines of the natural and engineering sciences.

The **Department of Psychology** is counted among the leading psychology institutes in Germany and achieved top places in the latest 2016/17 CHE university rankings both for its research performance (external funding obtained, publications per scientist and citations per publication) and the quality of its teaching (student satisfaction with study conditions, course offers and career relevance). The department is characterised by its empirical, natural-science approach, which enables experimental basic research to be combined with studies relating to clinical and socio-technical applications. Its research profile is focused on three interdisciplinary and internationally oriented research interests:

I. Cognitive-affective neuroscience;
II. Clinical psychology and psychotherapy; and
III. Human performance in socio-technical systems.

These key topics are also taken up in the teaching of three corresponding Master degree programmes.

The department is exceptionally well-equipped and the new laboratory centre set up in 2014 offers facilities for cognitive, neuropsychological and EEG studies, as well as transcranial magnetic stimulation, eye-tracking, clinical-psychological, epidemiological, psycho-endocrinological and molecular-genetic studies. The department is furthermore one of the few psychology institutes which possesses its own neuroimaging centre, with an MRT research scanner offering facilities to measure the neural correlates of psychic processes using magnetic resonance tomography. This outstanding laboratory infrastructure serves as the methodical backbone for numerous research projects (e.g. on the neurocognitive foundations of action control, on the conditioning factors of psychological disorders and innovative therapy methods, on the development of cognitive-affective functions over a lifetime, and on the conditions for human performance in work, business and education). Within the framework of the DFG Collaborative Research Centre "Volition and cognitive control: Mechanisms, modulators, dysfunctions" (www.sfb940.de), which was installed in 2012 and is headed by Prof. Thomas Goschke, an interdisciplinary team comprising over 70 researchers from the fields of psychology, medicine and neuroscience is cooperating with partners from the Charité University Hospital in Berlin to explore the cognitive and neural mechanisms underlying our volitional control over actions and emotions, as well as causes for impairments of self-control. Based on a particularly positive evaluation of the research centre by an international

review committee, the DFG approved a second four-year funding period in May 2016.

The integration of cutting-edge international research, outstanding teaching and interdisciplinary research cooperation guarantees a multitude of attractive opportunities for study applicants and researchers alike.

https://tu-dresden.de/mn

image credit: Amac Garbe

School of Humanities and Social Sciences
Faculty of Education

The Faculty of Education at TU Dresden was founded in 1993 and has become one of the largest faculties of education in Germany. Facilities for teacher training in mathematics and the natural sciences have already existed since 1855, known then as the so called Royal Polytechnical School of Dresden, a precursor of today's Technische Universität Dresden. Today, once more, the close integration with engineering and natural science studies is essential to the implemented model of vocational teacher training. The Faculty of Education has always very closely cooperated with the other faculties of the university with regard to school teaching qualifications, and has become an important member of the School of Humanities and Social Sciences at TU Dresden.

The faculty's current teaching and research covers the whole spectrum of education topics from teacher training and vocational education, via social education and further training, through to media teaching and the variety of biographical education processes. In doing so, it reflects the fact that the fundamental approach of lifelong learning is highly respected. At the same time, the disciplinary diversity is a basis for the faculty's extensive inter- and transdisciplinary networking, with contributions to numerous university competence centres, as well as to the Centre for Teacher Education, Formal and Professional Education Research and the University Media Centre.

The faculty cooperates with various regional, national and international partners in both its teaching and research, and has acquired an excellent reputation as an advisor to Saxon social and education politics. Many of its study courses are embedded into a rich international context through a diversity of EU exchange programmes.

Research at the Faculty of Education places a particular focus on investigation of the interactions between the characteristic domains of education, career and social affairs/health, and is thus inherent to TU Dresden's interdisciplinary Research Priority Area "Culture and knowledge".

The core topics of this research profile deal with both school-based and extra-curricular education, training and support, along with the promotion of vocational and social education occupations, and the specifics of further education and vocational training.

Special attention is paid to the development of young academic talent. The faculty is able to report high numbers of doctorate degrees awarded and a growing interest in doctorate studies at the Faculty of Education shown by foreign graduates.

The know-how bundled in the three education institutes at the faculty also benefits the whole university in other fields: The faculty was instrumental in the establishing of the University Media Centre and assumed a pioneering role in academic and scientific publications by founding the first open-access journal in the humanities and social sciences.

https://tu-dresden.de/ew

image credit: Martin Müller

School of Humanities and Social Sciences
Faculty of Law

Martin Luther once said: “A lawyer, who is no more than a lawyer, is a poor thing.”

True to these wise words, starting in the winter term 2007/2008, TU Dresden’s Faculty of Law offered the Bachelor’s degree “Law in Context - International perspectives relating to technology, politics and business”, which not only conveyed fundamental legal competence, but also introduced an interdisciplinary and international dimension, meeting the highest academic demands. Despite its great popularity and around 250 new students each year, this study concept will be discontinued. The Federal State government has decided to suspend this degree programme. In the winter semester 2016/17 new students were able to enrol for the final time.

Graduates of the “Law in Context” degree programme and all prospective students have the opportunity to pursue advanced study options at the Faculty of Law.

The Master programme “Business Law – Enterprises between freedom and state control”, is particularly popular with students. The practice-oriented course profile targets interdisciplinary interfaces of the regulated markets for energy, technology and transport, as well as business and taxation law. Through this innovative approach, the Faculty of Law offers both their own Bachelor graduates and external students an attractive study programme tailored to the latest needs of the career market.

The elite programme “International Studies in Intellectual Property Law” offered by the Institute for Intellectual Property, Competition and Media Law (IGEWeM) has already been implemented to great acclaim for many years. This postgraduate programme leading to a Master of Laws degree (LL.M.) is organised in cooperation with the University of Exeter, the Centre d’Études Internationales de la Propriété Industrielle at the University of Strasbourg, the Charles University in Prague, the Jagiellonian University in Kraków, the University of Washington (Seattle), Queen Mary College at the University of London and the University of Szeged, and provides for specialisation in industrial property rights and copyright.

Non-lawyers are similarly able to take certificate courses in patent law or copyright, media and internet law, and can thus acquire the legal knowledge which is urgently required in many other professions.

Moreover, the Faculty of Law is actively involved in the MA programme “Politics and the Constitution” (“Politik und Verfassung) run by TU Dresden’s Faculty of Arts, Humanities and Social Science. This degree course provides in-depth knowledge of the interaction and analysis of political processes and the constitutional structures they are governed by.

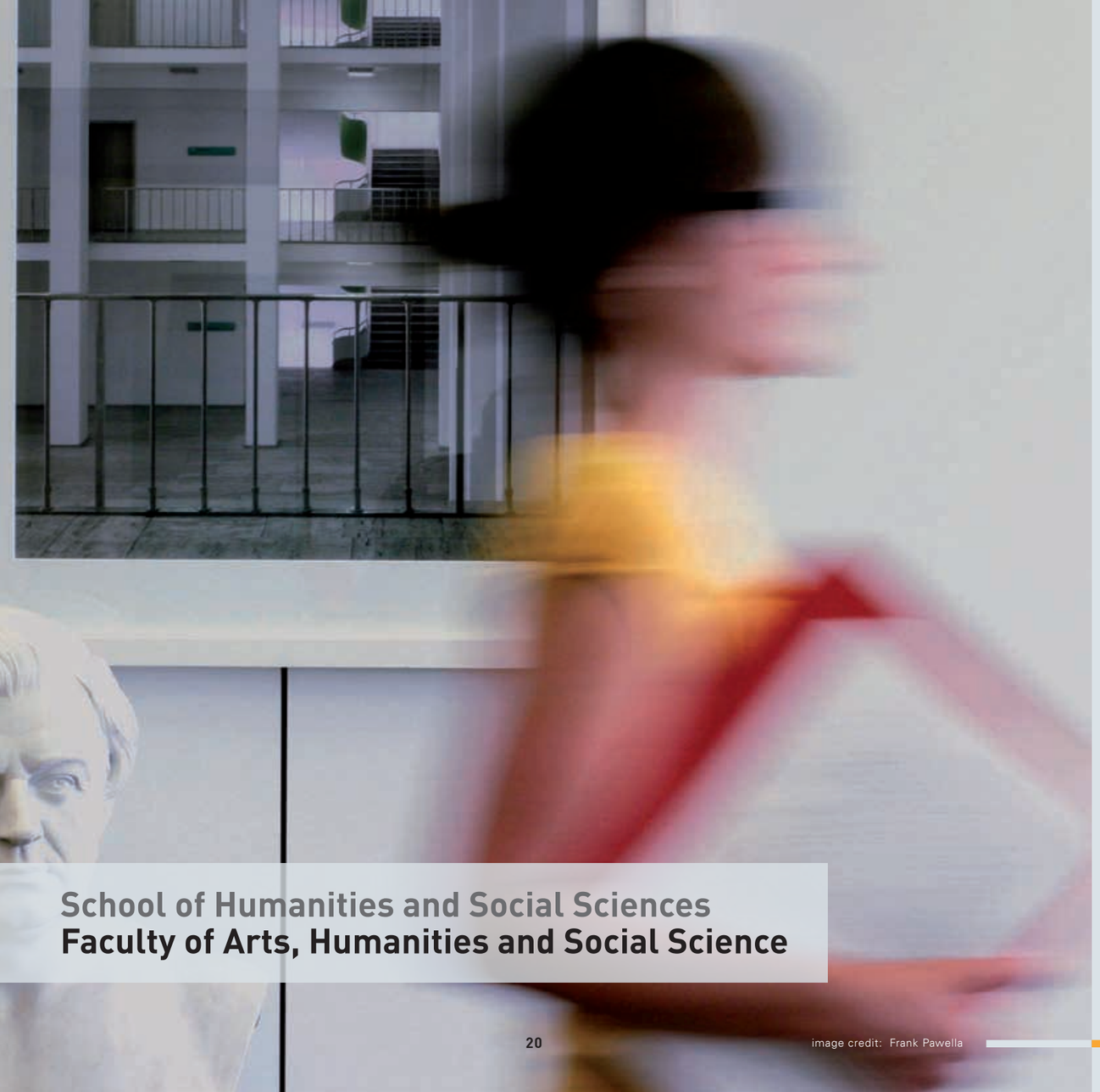
The Bachelor and Master programmes “International Relations”, which were initiated in cooperation with the Centre for International Studies, are further study options which have gained an outstanding reputation beyond Germany’s borders. These interdisciplinary courses combine the fields of international law, international business, international politics and contemporary history. Classes in two foreign languages and a half-year term abroad are mandatory course elements. A Bachelor degree is awarded after six semesters, and a Master degree can be earned after nine semesters. The students are hand-picked: A mere 30 places are offered each year, and are allocated on the basis of an entrance examination.

The international and interdisciplinary character of the faculty becomes especially evident in the list of key research fields, for example European law, technology and environment law, and in particular intellectual property, business and energy law. The international aspect is further supported by the faculty’s extensive ERASMUS programme. The Faculty of Law maintains links to numerous partner universities in other countries, and hence can offer students ideal and financially assisted opportunities to spend part of their course abroad.

Alongside the traditional forms of teaching, students are able to take part in alternative forms of knowledge transfer: Mock trials and excursions establish a vivid awareness of selected legal issues. New methods of conflict settlement are learned in courses on mediation and rhetoric.

https://tu-dresden.de/jura

image credit: Lutz Liebert



School of Humanities and Social Sciences
Faculty of Arts, Humanities and Social Science

Those looking for a comfortable ivory tower are at the wrong address in the Faculty of Arts, Humanities and Social Science in Dresden. Courses covering the whole spectrum of humanities and social sciences guarantee a lively blend of socially relevant teaching and research which at the same time has a broad international network and is firmly anchored in local traditions.

With around 2,500 students, the faculty is one of the larger faculties at TU Dresden. Furthermore, since May 2012 it has pooled resources with the academically related faculties of linguistics, literature and cultural studies, education, law and business and economics under the roof of the "School of Humanities and Social Sciences". Through even closer cooperation, the exploitation of synergy benefits in research, teaching and administration is strengthened.

The eight institutes – Art and Music, Catholic Theology, History, Media and Communication, Philosophy, Political Science, Protestant Theology and Sociology – offer more than 20 courses and course subjects. Each of the Bachelor degree programmes comprises a major and at least one minor component. Master courses then expand this knowledge by developing specialised competence, again complemented by profile components from other disciplines or even other faculties. Subjects offered by the Faculty of Arts, Humanities and Social Science can also be combined with those of other faculties within the framework of teacher-training programmes.

ERASMUS programmes permit studies to be extended to the universities in Alicante, Amsterdam, Barcelona, Bordeaux, Ghent, Izmir, Leiden, Milan, Murcia, Naples, Olomouc, Pamplona, Paris, Prague, Stockholm, Strasbourg, Turin and Wrocław.

Exchanges have also been arranged with the "New School" University in New York for a number of years. Joint doctorate degrees can be awarded with the École Pratique des Hautes Études (EPHE) in Paris in most disciplines, and a double degree in sociology is offered in cooperation with the University of Trento.

For all their discipline-specific differences, the institutes of the Faculty of Arts, Humanities and Social Science pursue an essentially common goal: They seek explanations and interpretations for human thought and behaviour at both the individual and social levels, and in doing so contribute to the understanding and positive shaping of the social and cultural transformations which characterise today's world in its interactions with technical progress. The analysis addresses phenomena such as globalisation, knowledge expansion, social fragmentation and specialisation, cultural and religious change, and digitalisation and mediatisation. These contributions are based on a diversity of methods and theoretical approaches. This plurality, in particular, is one of the key strengths of the faculty, and is also reflected in the range of studies offered.

Proof of the faculty's special commitment to interdisciplinary research has been furnished through the organisation of two Collaborative Research Centres, founded by the German Research Foundation (DFG): "Institutionality and Historicity", "Transcendence and Public Spirit" and an international graduate college in conjunction with the EPHE in Paris. Interdisciplinary cooperation between contrasting scientific cultures is also practised by the Boysen-TU Dresden Graduate College "Sustainable energy systems – Interdependence between technical designs and social acceptance", which

image credit: Frank Pawella

brings together communication specialists, political scientists, economists and engineers.
Each of the institutes has something special to offer in both teaching and research. The Institute of Political Science, for example, places a focus on international organisations, while the Department of History of Art concentrates on the art of the Late Middle Ages and Early Modern period, as well as the more contemporary media of photography and film. The Department of Music combines historical exploration with a culturally oriented profile and a systematic, cognition-based approach. The principal research interests in philosophy lie in the fields of normative epistemology and the later philosophy of Heidegger, whereas the Institute of Media and Communication concerns itself above all with the modern transformation processes and tier impact on the quality of public communication, particularly in the contexts of journalism and scientific communication. Cultural sociology and research methodology range among the subjects focused upon by the Institute of Sociology. In the Institute of Protestant Theology, finally, cultural-hermeneutical viewpoints enable the religious traditions of Christianity to be investigated not only as self-explanations of the Church, but also as general cultural phenomena.

Studies are furthermore enriched by a diversity of partnerships with institutions in the fields of culture, religion, society, politics and media. There is close cooperation, for example, with the Saxon State and University Library Dresden (SLUB), one of the largest scientific libraries in Germany. Scholars from the world-famous Dresden State Art Collections support teaching in history of art as honorary professors. The Institute of Protestant Theology works with the Deutsches Hygiene-Museum to present joint events, as does the Institute of Political Science with the Dresden ‚Theology with "Kathedralforum Dresden". The Institute of History is a partner to the Institute for Saxon History and Ethnology, while generous donations enable the Department of Art and Music to make a collection of rediscovered "Music Treasures from Dresden" available for public download. On a regular basis, a large audience is attracted by the public lectures of the Institute of Media and Communication, at which high-ranking journalists and politicians speak on current topics of political communication.

https://tu-dresden.de/phil

image credit: Sybill Friese

School of Humanities and Social Sciences
Faculty of Linguistics, Literature and Cultural Studies

Building upon a solid philological foundation, the Faculty of Linguistics, Literature and Cultural Studies places an explicit focus on the cultural aspect in its studies. In each of the five departments at the faculty, the teaching and research activities highlight the language, literature and culture of a wide range of countries and regions.

The Department of English and American Studies directs its attention not only to the English language and anglophone culture areas Great Britain and North America, but also, for example, to the Indian subcontinent. The numerous research projects conducted by members of the department address topics such as TV seriality, masculinity narratives and gender studies (e.g. research within the framework of the GenderConceptGroup).

The Department of Romance Studies considers the worldwide cultural areas in which the French, Spanish and Italian languages are spoken. It is also home to the Italian Centre, to CIFRAQS (Centre for Interdisciplinary Franco-Canadian and Franco-American Studies Québec-Saxony), and to ReLa (university-wide course offers under the heading Regional Studies of Latin America).

In similarly comprehensive manner, the whole Slavic cultural area – not only Russia, but above all Poland and the Czech Republic – are the subjects of academic endeavours at the Department of Slavic Studies. Particular mention is to be made of the ESF junior research group "Sorbenwissen" ("SorbKnowledge"), which brings Slavists together with fellow scholars in philosophy, history and theology, as well as the VW Foundation project "Aggression and Argumentation": Discourses of Conflict and their Linguistic Negotiation". The interests of the Department of German Studies address numerous cultural interfaces: Its teaching and research relate to the whole Central European cultural area and take into account both the historical dimensions of language and literature, and present-day communication and media structures. Furthermore, the teaching fields of "German as a Foreign Language" and "German as a Second Language", are offered as a separate specialisation.

A Master course in "European Languages (EuroS)" is aimed at foreign students of German who have completed at least three years of study in their own country or have already obtained a Bachelor degree. Pivotal importance is attached to a strong intercultural reference and to language skills in the three major European language families.

The Department of Classical Philology devotes itself to the literature of Ancient Greece and Rome, which represents the linguistic and cultural foundation of present-day civilisation, but at the same time differs so strongly from our current world, that it is constantly perceived in our interpretations as a "most familiar foreign culture".

The acquisition of foreign language and intercultural skills is naturally an inherent component of the training. The international motivation of the faculty is further strengthened by the high proportion of foreign students and the regular contributions of guest lecturers from abroad.

https://tu-dresden.de/slk

image credit: Sören Lubitz

School of Humanities and Social Sciences
Faculty of Business and Economics

TU Dresden's Faculty of Business and Economics is one of the largest in Eastern Germany and counts around 2,500 students. The spectrum of degrees offered is especially broad, with two Bachelor programmes (economics and business management; business and economics education), two Diploms programmes (business informatics; industrial engineering) and five Master programmes (business management; economics; business and economics education; business informatics; industrial engineering). Particular importance is attached to modern didactics and innovative teaching methods, including interdisciplinary multimedia programmes for university teaching and self-organised learning. E-learning enables students to expand their knowledge independently of both time and location.

Former UN Secretary-General Kofi Annan is an honorary doctor of TU Dresden's Faculty of Business and Economics alongside further representatives of international politics and business. This award was more than just a symbol: The cosmopolitan atmosphere which reigns here is also reflected in agreements on bi-national degrees with universities in France and Italy, diverse university partnerships, and a curriculum geared towards flexible, internationally compatible studies. The proportion of foreign students in Dresden is at a constantly high level of around 10 per cent. International cooperation is also promoted through annual prize awards. The Dr. Händel Prize and the German Federal Bank Prize, for example, allow scientific staff to conduct research abroad, and permit invitations to be extended to visiting scientists. The Prof. Endriss Prize, on the other hand, offers financial assistance to students wishing to spend part of their course in another country.

With a total of 22 professors and 2 junior professors representing the fields of business management, economics and business informatics, research at the faculty covers a wide diversity of topics and is characterised above all by an interdisciplinary and distinctly methodology-oriented approach. The faculty is at the same time involved in various competence centres and central units of TU Dresden, among them the Centre for Demography and Diversity, the Health Economics Centre (GÖZ) and the Centre for International Studies (ZIS). Students who are thinking of setting up their own business will find competent partners in the business founders' network "dresden I exists". The team of "dresden I exists" promotes entrepreneurial thinking, conveys specialist knowledge, trains business acumen and helps to establish contacts.

Finally, Dresden is an ideal location for direct interactions between academic study and scientifically founded political advice. The local branch of the ifo Institute for Economic Research is located in the immediate vicinity of the faculty. Through the close relationship with this extra-mural research institute, academic research draws new ideas from insights into important economic policy issues.

https://tu-dresden.de/wiwi

image credit: Klaus Gigga

School of Engineering Sciences
Faculty of Electrical and Computer Engineering

With approx. 2,600 students, 29 professors and 4 junior professors, the Faculty of Electrical and Computer Engineering is one of the largest at TU Dresden. The broad scope of research and teaching is reflected in the faculty's maxim of "Thinking in systems", with a main focus being placed on automation, measurement and control technologies, electrical power engineering, electromechanical and biomedical systems, information electronics, communications engineering, and micro-, opto- and nanoelectronics.
Everything seems to be planned perfectly, and it is thus no surprise that the faculty is usually to be found among the leaders in national rankings. Armed with their broad scope of skills and abilities, graduates of the faculty enjoy an excellent reputation among potential future employers which is regularly confirmed in surveys conducted by leading trade magazine: The faculty is regularly among the top ten responses when HR managers are asked to name the German university which produces the best graduates in the field of electrical engineering.

The faculty currently offers four Diplom degree programmes with a standard study duration of 10 semesters: Not only electrical engineering in the classic form, but also interdisciplinary programmes in information systems engineering (with the Faculty of Computer Science), mechatronics (with the Faculty of Mechanical Science and Engineering and the Faculty of Transport and Traffic Sciences) and renewable energy systems (with the Faculty of Mechanical Science and Engineering). Such interdisciplinarity is daily practice in all courses and an inherent element of the research-oriented training concept. Alongside the Diplom programmes, students can also enrol for Master programmes in electrical engineering and nanoelectronic systems (the latter taught in English).

Particular attention is paid to support for the first-year students, with an intensive preparatory and mentoring programme to smooth their path to study success.

Close networking characterises the links to numerous foreign partners. The approximately 40 European universities the faculty cooperates with the framework of the EU-wide ERASMUS programme are spread over the whole continent. Students who wish to spend one or two semesters abroad during their studies can choose from an extensive list of internationally renowned universities. Exceptional study achievements are also rewarded with the opportunity to augment the targeted degree from TU Dresden with a second qualification awarded by a university of the French "Groupe des Écoles centrales" within the framework of a double-degree programme.

The contacts to industry and to extra-university research organisations, e.g. the Fraunhofer Institutes, are equally strong; this cooperation seeds outstanding perspectives for both sides. Numerous industry-funded research projects and business spin-offs from faculty institutes, as well as two industry-funded endowed chairs (Communication Networks and Mobile Communications Systems), are testimony to this fruitful and practice-oriented cooperation in the field of high-tech research. The students also profit from this arrangement through early experience in an application-oriented environment and can establish contacts invaluable for their later careers.

The outstanding research competence of the faculty is manifested in the DFG Collaborative Research Centre "HAEC – Highly Adaptive Energy-Efficient Computing", for which a second phase of funding extends through to June 2019. The research centre is a central pillar of the Cluster of Excellence "Center for Advancing Electronics Dresden" (cfaed). The members of this Excellence Cluster are presently exploring new materials, technologies and systems for the electronics of the future, in the hope of overcoming the foreseeable limitations of today's solutions.

https://tu-dresden.de/et

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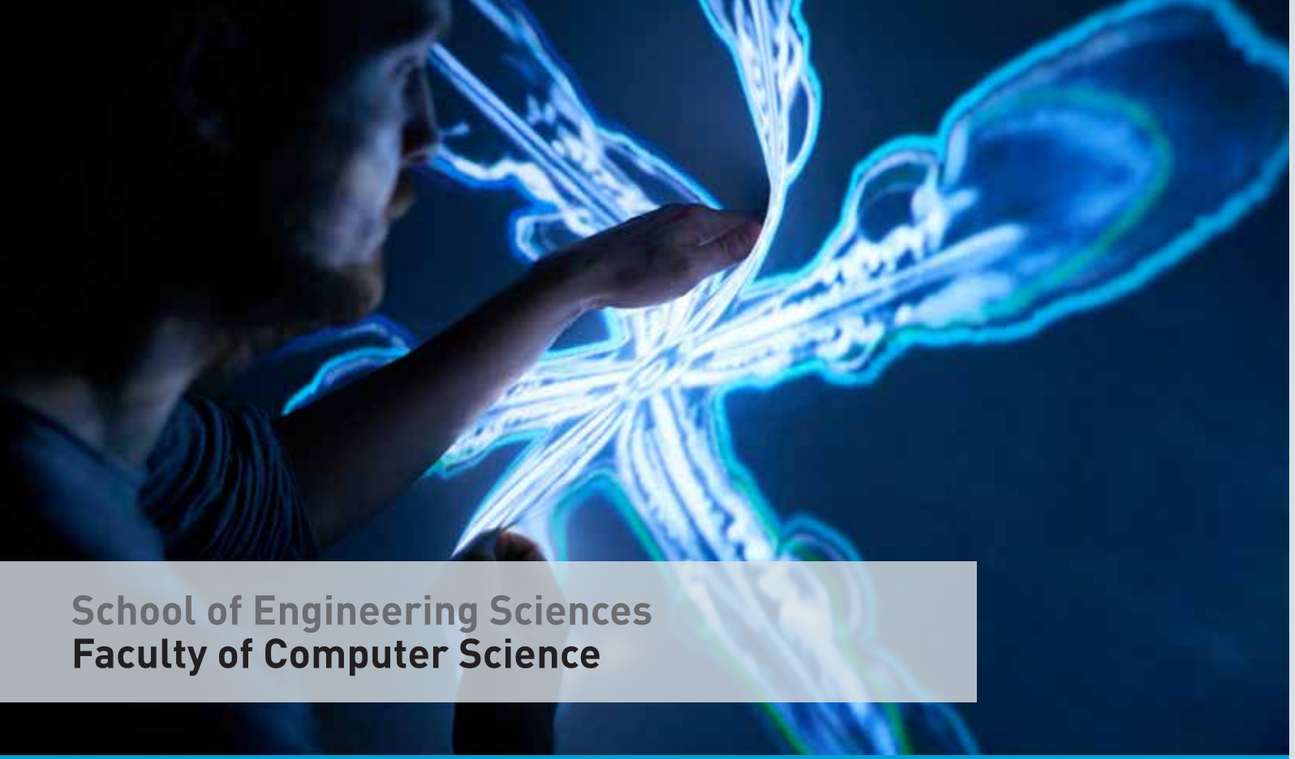

School of Engineering Sciences
Faculty of Computer Science

With over 1,800 students, the Faculty of Computer Science is one of the largest in the field in Germany. The teaching for a total of twelve separate study courses is closely interwoven with research activities. Cutting-edge basic research goes hand in hand with application studies and industry cooperation. The key areas of current research are: 1. Software technologies and their use in cyber-physical, mobile and hardware-related systems; 2. Internet of services, cloud computing and Internet security; 3. Data-intensive computing, big data and knowledge extraction; 4. Human-computer interaction and visual computing; 5. Formal modelling and analysis of artificial systems; 6. Modelling, machine-learning and simulation of natural systems.

Following up the faculty's successful involvement in the high-end Cluster "Cool Silicon", the university´s Excellence Initiative has also further strengthened funding for the Center for Advancing Electronics Dresden (cfaed) as a "Cluster of Excellence". The objective is to explore new avenues for electronic information processing in the future, to overcome the limitations of today's CMOS technologies. To this end, the computer scientists are investigating technologies which permit reliable calculations even with fault-sensitive hardware, as well as systems with multiple and heterogeneous chips. One core element of the Cluster of Excellence is the Collaborative Research Centre HAEC ("Highly Adaptive Energy-Efficient Computing"), whose visionary goal is to find answers to the increasing energy consumption attributable to global internet use and the resulting ecological impact.
Together with colleagues from the Faculty of Science and the Faculty of Electrical and Computer Engineering, the researchers are working on designs for new computer systems with enhanced adaptivity and energy efficiency. The national big data competence centre ScaDS (Scalable Data Services and Solutions) and the newly opened 5G Lab Germany demonstrate the considerable development potential of the location as an arena for broad interdisciplinary research.

Two DFG graduate colleges enable postgraduate students of the faculty to conduct research at the highest scientific level in pursuit of a doctorate degree. Organised jointly with the University of Leipzig, the graduate college "QuantLA" provides training for 20 young doctorate students, with foremost opportunities to explore the correlations between quantitative logics and automata models, alongside their potential applications in computer science. At the graduate college "RoSI", twelve doctorate students are presently investigating role-based software infrastructures for consistently context-sensitive systems.

Student research results are presented through interactive demos, lectures and workshops at the regularly well-attended OUTPUT DD event, which is held in the inspiring atmosphere of the faculty building each year.
The ultramodern infrastructure of the Faculty of Computer Science includes special laboratories with 3D projection and tracking hardware, a 10 m^2 high-resolution interactive display wall, and audio and video editing facilities. Visually impaired students from all faculties are offered optimum conditions for their chosen studies at TU Dresden in the form of special software, magnifiers and Braille print-outs. The High-Performance Computing and Storage Complex (HRSK-II) and the new Data Centre II which was inaugurated in close proximity to the Faculty of Computer Science in 2015 lend further sustained support to future science and research achievement in Saxony.

In addition to classic computer science, the faculty offers further innovative study courses: Media computer science, for example, places a special focus on digital media.
Information systems engineering, on the other hand, is an engineering degree course organised jointly with the Faculty of Electrical and Computer Engineering, with its emphasis on system technologies. A new Master programme in computational science and engineering, which is realised in cooperation with the TU Bergakademie Freiberg, addresses the field of data-intensive computing. The English-language Master programme in computational logic is to date unique in Germany; a small, select group of mainly foreign students explores, for example, the foundations of logic and constraint programming. The Master programme in distributed systems engineering, which is held in English as well, places its focus on the designing of large-scale distributed IT systems. The European Master programme in computational logic, the international cooperation agreements, guest lecturers, and possibilities for studies and practical experience abroad all pay testimony to the international outlook of the faculty.

https://tu-dresden.de/inf

image credit: Torsten Proß, Jeibmann Photographik

School of Engineering Sciences
Faculty of Mechanical Science and Engineering

Technology without borders

image credit: Torsten Proß, Jeibmann Photographik

Technology without borders

The Faculty of Mechanical Science and Engineering has been providing teaching and research in pursuit of technical progress and human advancement for over 180 years. With over 6,000 students, it is the largest faculty at TU Dresden.

Excellent training – broad diversity

Mechanical engineering, process engineering and natural materials technology, material science, mechatronics and regenerative energy systems: Five courses of study offer a total of 25 specialisations – from general machinery to food engineering, from energy efficiency to applied material science, and from lightweight design to aerospace. After all, the broader the range of options, the greater the flexibility for our students when it comes to choosing a specialisation for the advanced course stage in their third year.

Living research – close networking

External funding totalling at over €60 million per year testifies to the research strength of our faculty. Here, students are involved from an early stage, enabling them to translate theory straight into practice. Close networking with external research facilities in Dresden is a matter of course and is mutually beneficial. The cooperation with the Helmholtz Zentrum and the Fraunhofer and Leibniz Institutes facilitates access to interesting practical experience in industry and research, and opens the door to course-related student jobs.

Diplom-Ingenieur – a mark of quality

TU Dresden is one of the few German universities which still offers single-tier study programmes leading to a Diplom degree. Despite the adaptation to enable international comparability in accordance with the Bologna process, we remain

committed to this classic engineering degree: Firstly, because the German “Diplom-Ingenieur” title is globally recognised as a hallmark of quality. Yet, at the same time because a Bachelor degree obtained after six semesters is in practice not a fully sufficient qualification for the holder to enter a professional career. A modularised Diplom programme – without intermediate hiatus – is effectively the time-saving path to the required degree.

Promoting internationality – treading new paths
The Faculty of Mechanical Science and Engineering offers more international double-degree programmes than any other German university. Students hungry to gain experience abroad are able to study general and constructional mechanical engineering, production technology or simulation methods of mechanical engineering in Paris and Metz, energy technology in Ostrava or mechanical engineering in Shanghai. It is frequently the case that personal biographies diverge from the traditional course – we have adapted to this development and offer mechanical engineering degrees through a correspondence course – as the only university to do so! To further facilitate the move to a new city or country, we even enable students to graduate from the Diplom programmes in mechanical engineering, material science or process engineering and natural materials technology with a Bachelor degree after the 6th semester.

Ideal support – excellent teaching
Starting university, the first examination period and hundreds of formalities which must suddenly be taken care of: The transition from school to university life is a big step – not only academically. To smooth the path for the more than 1,000 new students each year, the Faculty of Mechanical Science and Engineering has set up a new mentoring programme. A group of 30 older students and postgraduates offer their assistance to the faculty newcomers. Supplementing the existing network of professors and administrative offices, we have in this way created an additional layer of support with contacts who are not only of similar age, but also know the university well from their own student experiences.

The Faculty of Mechanical Science and Engineering also awards an annual “Prize for Innovation in Teaching” to one of its professors, as recognition for commitment to the utilisation of new media. The students alone are entitled to nominate the recipient.

https://tu-dresden.de/mw

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School of Civil and Environmental Engineering
Faculty of Architecture

Architecture and landscape architecture both in a single faculty: a rare combination wherever you look in Germany. In Dresden, however, this symbiosis has a long-standing tradition and is a prominent element of the faculty's profile, alongside the distinctly design-oriented focus of the training. Balancing the theoretical, artistic, technical and ecological aspects of our living environment is the basis for all work at the faculty.

Current research activities cover a broad spectrum of topics, ranging from building materials and aspects of building physics, via architectural history and the new challenges facing architecture in the information age and in the context of demographic change, through to elements of sustainable urban and regional development and the shaping of landscape transformation processes. The Faculty of Architecture is also a contributor to numerous interdisciplinary research projects and institutes, for example the newly founded Construction Research Centre, the Competence Centre Colour or the Health Economics Centre.

The spectrum of study opportunities follows the continuous developments in research interests. Interdisciplinary seminars, excursions and the modular structure of the study programme ensure that the courses offered by the faculty not only convey knowledge, but also rehearse its competent application in small project groups – just as a professional working or research group would.

It cannot be denied that Dresden is an attractive city in which to study – but external views and perspectives are of equal importance. The partnerships with foreign universities are thus an essential component of the curriculum, in the form of student and lecturer exchanges, joint design seminars, summer schools and excursions. The faculty offers a German-French double degree in architecture. Around five per cent of the students spend part of their course at a university abroad. At the same time, most students make use of opportunities to complete their mandatory office internship abroad.

Those who have still not had enough of studying in the evenings can look forward to a special film series

"Architecture in Cinema" at student-friendly prices. The lecture series "spann_weiten" reflects the full spectrum of contemporary architectural creativeness, with speakers who are as different as their individual topics. The maintenance and further development of cultural buildings are discussed in "Work Reports on Monument Preservation", and urban planning topics are also the subject of a series of lectures entitled "Werk-Stadt-Gespräche". The annual "Dresdner Planergespräche" meetings provide a nationally recognised forum for landscape planners, and the city also hosts a regular international colloquium for doctorate students.

https://tu-dresden.de/arch

image credit: Lucas Reyer (left), Till Schuster (right)

School of Civil and Environmental Engineering
Faculty of Civil Engineering

There are many universities at which you can study civil engineering – but only few "Universities of Excellence". And only one of those selected few enables you to obtain the title of "Diplom-Ingenieur", namely the Technische Universität Dresden. The more demanding Diplom degree programme has been offered here without interruption, providing access to a title which is recognised worldwide as a hallmark of quality.

Of course, Dresden's civil engineers are not retreating into a lonely enclave in the European world of civil engineering training: The course programmes have been reformed and modularised in the spirit of the Bologna model, and are thus open for the promotion of Europe-wide study opportunities.

There are still numerous other reasons for the outstanding attractiveness of the Faculty of Civil Engineering, which belongs to the School of Civil and Environmental Engineering at TU Dresden. A ideal lecturer-student ratio is the key to the desired learning success. With around 1,600 students, the faculty is one of the smaller faculties at TU Dresden. Its members know each other well, study together – and celebrate together. That strengthens personal ties and creates a group identity.

Students are involved in the research work of the faculty from an early stage. They become acquainted with the latest developments in the individual disciplines through lectures and practical exercises, and can even contribute actively by working as student assistants. For those who show particular dedication, the first employment contract after graduation could well mean an opportunity to continue the quest for new knowledge as a research assistant for the university.

External cooperation is maintained with 37 partner universities in 17 countries. More than 250 students from 15 different nations are studying and conducting research at the faculty. Excursions permit students to work in real-life settings, and the well-equipped laboratories are likewise the foundation for efficient and practice-oriented teaching. From a dedicated hydraulic engineering lab to a faculty data centre and computer clusters in the individual institutes, the students benefit in many ways from an excellent technical infrastructure.

The research profile of the faculty is defined by topics which are undoubtedly among the most innovative in civil engineering. Textile-reinforced concrete was invented in Dresden and through its further development – carbon concrete composite – is a pivotal research interest; the DFG Priority Programme "Lightweight construction with concrete" is coordinated by the Institute of Concrete Structures. The Institute of Hydraulic Engineering and Technical Hydromechanics, on the other hand, is one of seven partners from science and engineering practice who are investigating solutions for ecological flood risk management and natural watercourse development within the framework of the BMBF-sponsored network research project "In_StröHmunG".

Innovative methods which take into account uncertainty in the numerical design of structures are being developed under the DFG Priority Programme "Polymorphic uncertainty modelling", for which the Institute for Structural Analysis has the coordinating lead.

The fact that civil engineers also carry their research far beyond discipline boundaries is demonstrated by a research group at the Institute of Mechanics and Shell Structures, which is currently exploring the biomechanics of soft biological tissues. The moulded wood technology developed and patented by the Institute of Steel and Timber Construction is a prime example of how the typical scope of civil engineering applications is frequently transcended; this highly acclaimed innovative material has earned numerous prizes and is suitable for use in a plethora of situations.

Cutting-edge research and the fun of student life are by no means mutually exclusive. On the contrary: Students have applied the research into textile-reinforced concrete to design super-lightweight concrete boats, with which they have collected a whole series of regatta prizes. A traditional paper bridge competition also pairs civil engineering know-how with light-hearted rivalry, and the social commitment of third-year students, furthermore, has contributed to the expansion of several children's playgrounds in Dresden.

https://tu-dresden.de/bau

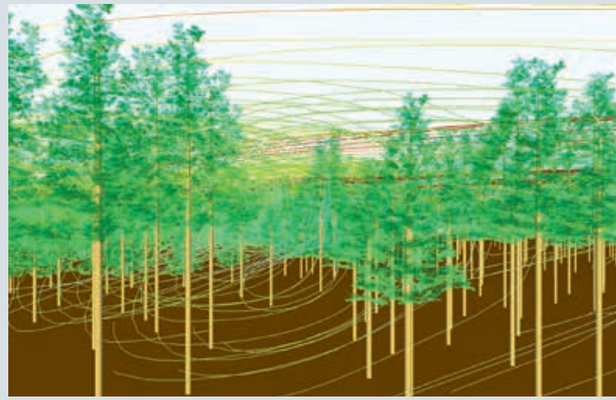
image credit: Ulrich van Stipriaan

School of Civil and Environmental Engineering
Faculty of Environmental Sciences

The faculty's profile is unique in Germany and has a strong international outlook. It unites three essential environment-related science fields under one umbrella, and this interdisciplinary and international approach enables significant synergy benefits. Activities are focused on monitoring and modelling of the "Earth System" on the global, regional, and local scales, and use of this knowledge in the context of the sustainable development of the human environment. Research and teaching cover a wide range of topics and are firmly embedded in both regional and international networks. Joint professorship appointments have been established with the Helmholtz Zentrum for Environmental Research (UFZ) in Leipzig and the Leibniz Institute for Ecological Urban and Regional Development (IÖR).

The **Forest Sciences** focus on various aspects of creating added value in rural areas and of designing forests as multi-functional ecosystems. Sustainable land-use concepts, for instance, integrate the production of woody biomass for energy generation purposes with the protection of biodiversity, water resources, soil and climate. The department offers traditional forestry programmes, as well as interdisciplinary study options with an international outlook. The English-language Master degree programme in Tropical Forestry and Management, for example, is geared especially towards international students. A further noteworthy programme is the Master degree in Wood Technology and Management, which is awarded jointly with the Faculty of Mechanical Science and Engineering and reflects the growing significance of renewable resources.

The **Geosciences** examine the development and utilisation of information technology to model and visualise the "Earth System" and to create accessible geodata infrastructures. Cross-faculty research is pursued in the field of measurement, analysis and management methods within the context of environmental monitoring. Further topics include settlement development, spatial planning and demographic change. Students are able to join Bachelor programmes in Geography, Geodesy and Geoinformation, or Cartography and Geomedia Systems. Advanced studies can be pursued through Master degrees in Geography,



Geodesy, Cartography (held in English) and Geoinformation Technology. In addition, school teacher-training qualifications are offered for Geography.

The **Hydrosciences** focus on water research in natural and technical systems and on the feedback of dynamic processes within the bio- and hydrosphere. This holistic approach to all aspects of the water cycle is unique in Germany. Topics such as Water Management, Hydrology and Hydrobiology, as well as Waste Managemet and Circular Economy can be studied within a broad environmental context. The English-language Master programme in Hydro Science and Engineering addresses a whole diversity of water research topics. Given the limited water security in many regions of the earth, it places emphasis on the development of water resources and the mitigation of floods and droughts. This is of special interest to students from developing and emerging countries. The Center for Advanced Water Research (CAWR) is operated together

image credits: Hans-Gerd Maas (left), Bernd Hetze (right)

image credit: Andreas Roloff

with the UFZ. It was within this same framework that the international research training group “Resilient Complex Water Networks” was established.

The broad spectrum of studies offered by the faculty is further complemented by a Master programme in Spatial Development and Natural Resource Management. Moreover, the Faculty of Environmental Sciences is the host of the special postgraduate course “Environmental Management”; this programme is unique in Europe and has in the meantime been offered for 40 years in close cooperation with the Federal Ministry for the Environment, the Federal Environmental Agency (UBA) and the United Nations (UNEP, Nairobi, and UNESCO, Paris). The primary goal is to provide specialists and managers from developing and emerging countries with sound academic training in integrated environmental management and related environment-specific fields.
Close cooperation and strategic partnerships are likewise cultivated with the FLORES Institute of the United Nations University (UNU). The mission of this Dresden-based UN institute is to contribute to the development of integrated management strategies for the sustainable use of water, soil and waste resources. For this purpose, a joint doctorate programme has also been established.

https://tu-dresden.de/uw

School of Civil and Environmental Engineering

„Friedrich List" Faculty of Transport and Traffic Sciences

Friedrich List (1789-1846) felt restricted in the Germany of his early days. His liberal views even earned him a spell of fortress imprisonment before he emigrated to America, where he founded a railway company. Later in life, he returned to Saxony and here he was a fervent advocate of industrialisation, a market economy and above all the development of a German railway network.

It would no doubt bring a tear of joy to his eye to witness today's scope of teaching and research at the Faculty of Transport and Traffic Sciences which bears his name at TU Dresden. The teaching is characterised by a holistic, systematic approach to the transport and communication processes in industry, the environment and society as a whole. The faculty counts almost 2,000 students and is the only one of its kind at a German university. Its programmes are open to all qualified applicants with an interest in engineering- or economics-oriented studies in the field.

Alongside its exclusive and unique degrees in transport engineering (Dipl.-Ing.), rail system engineering (M.Sc.) and transport economics (B.Sc. and M.Sc.), the faculty offers interdisciplinary Diplom degree courses in mechanical engineering with specialisations in automotive or rail vehicle engineering and mechatronics together with other Dresden faculties. From the academic year 2017/18 onwards, the portfolio of advanced study options at the faculty is to be expanded further with a Master degree programme in air transport and logistics.

Graduates of the faculty are trained to solve tasks which demand not only knowledge of the technical infrastructures (transport routes, vehicles, and information and safety technologies), information and communications processes, operational routines and the economic interactions between traffic and transport systems, but furthermore considerations of the ecological, social and psychological aspects – also in their wider spatial context.

The optimum support given by professors, tutors and mentors, alongside small-sized study groups, guarantees particularly effective studies. Modern laboratories, for example an integrated railway laboratory, a system laboratory for rail-bound vehicles, laboratories for flight simulation, signalling and traffic information, traffic process automation, the simulation of railway and control centre operations, as well as state-of-the-art vehicle engineering test stands and further facilities in the university's Vehicle Test Centre, form the basis for targeted engineering research, and enable students to prepare for later careers throughout the transport sector under real-world conditions.

A lucrative career is rarely a worry for graduates of the above programmes. The first contacts to front-line companies are already established during periods of practical work experience. Research cooperation agreements signed between the faculty and a diversity of private enterprises and institutions in the fields of transport, vehicle engineering and traffic science (for example the Fraunhofer-Gesellschaft, the German Aerospace Centre and the European Centre for Innovation in Rail Technology) lay the foundations for numerous projects in which the students are also involved.

Research activities at the "Friedrich List" Faculty of Transport and Traffic Sciences embrace the fields of traffic planning, traffic system engineering, traffic infrastructure design, automotive and rail vehicle engineering, traffic telematics and safety systems, traffic management, logistics, traffic ecology and traffic psychology, among others. The traffic science conferences which are held every two years are also highly renowned among experts from all over the world. It is thus hardly surprising that word of the outstanding reputation of Dresden's traffic scientists is spreading – as can be seen from the many graduates from other faculties who choose the city as the place to pursue their doctorate studies.

Further interesting applications for both research and teaching arise from Dresden's function as a junction of important European traffic corridors. The international commitment of the faculty is founded not least on the location of Dresden as a hub for science at the heart of Europe and at the interface between the countries of Central and Western Europe.

https://tu-dresden.de/vkw

image credit: Sebastian Terfloth

School of Medicine
Faculty of Medicine Carl Gustav Carus

The Faculty of Medicine Carl Gustav Carus embodies broad academic diversity, with degree courses in medicine, dentistry, public health and medical radiation sciences. Over 2,500 students are enrolled in these disciplines. Scientifically-oriented teaching, with strong practical and interprofessional aspects, establishes the reputation of university medicine in Dresden. In the Interprofessional Medical Training Centre (MITZ), basic skills and doctor-patient communication are trained in the smallest group possible, often with actors assuming the patient role. Those training sessions – some of which are attended together with trainees from the Carus Academy – are mandatory components of the longitudinal curriculum between the second and tenth semester. The interdisciplinary approach is intensified through a series of DIPOL® modules (Dresden system of Integrated practice- and Problem-Oriented Learning) starting in the fifth semester. At preclinical and clinical stages, training progress is supported by modern learning methods such as e-teaching and the Anatomage Table. Teaching and examination formats are expanded in line with the latest didactic findings – against this background Dresden introduced and continues to develop the OSCE format (Objective Structured Clinical Examinations.)

Dentistry students are provided with a modern teaching environment with 32 networked and fully digital workstations in the dental simulator lab. Offering practical experience in general dental surgeries and in oral and facial surgery practices, Dresden has assumed a pioneering role in Germany.

The range of study programmes also includes two Master courses. The aim of the supplementary Master programme "Health Sciences – Public Health" is to qualify students for research and operational tasks relating to the planning and management of national and international health services. The Master programme "Medical Radiation Sciences" trains specialists for the medical application of ionising radiation with a specialisation on physical aspects – leading at the same time to a qualification as a Medical Physics Expert (MPE), as recognised by the relevant nuclear authorities.

Within the framework of ERASMUS+ programme, interested students are given the opportunity to study at one of the faculty's many partner universities, e.g. in Spain, France, Italy, Austria, Latvia, Poland or Switzerland. In addition, undergraduates are able to complete part of their practical year in Sydney, Adelaide or London on a DAAD scholarship. Dentistry students are offered bilateral exchange programmes with the universities in Ghent and Leuven (Belgium), Dundee (Scotland) and Oslo (Norway), and with the Universidad Complutense de Madrid (Spain). For many years, internships lasting several weeks have been organised with the University of Alberta in Edmonton (Canada)

International exchanges are a prerequisite for outstanding teaching and cutting-edge research. The School of Medicine in Dresden lives this principle with staff and students from 73 nations, and through its cooperations with research teams from all continents of the world. The outstanding scientific environment and extensive international contacts are essential for the successful further development of both the university clinic and the faculty.

Key fields of research include oncology, diabetology, as well as neurological and psychiatric disorders. Here, a particular focus is placed on the interdisciplinary complexes of degeneration and regeneration, imaging and technology development, immunology and inflammation, and prevention and advanced care.

https://tu-dresden.de/med/mf

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