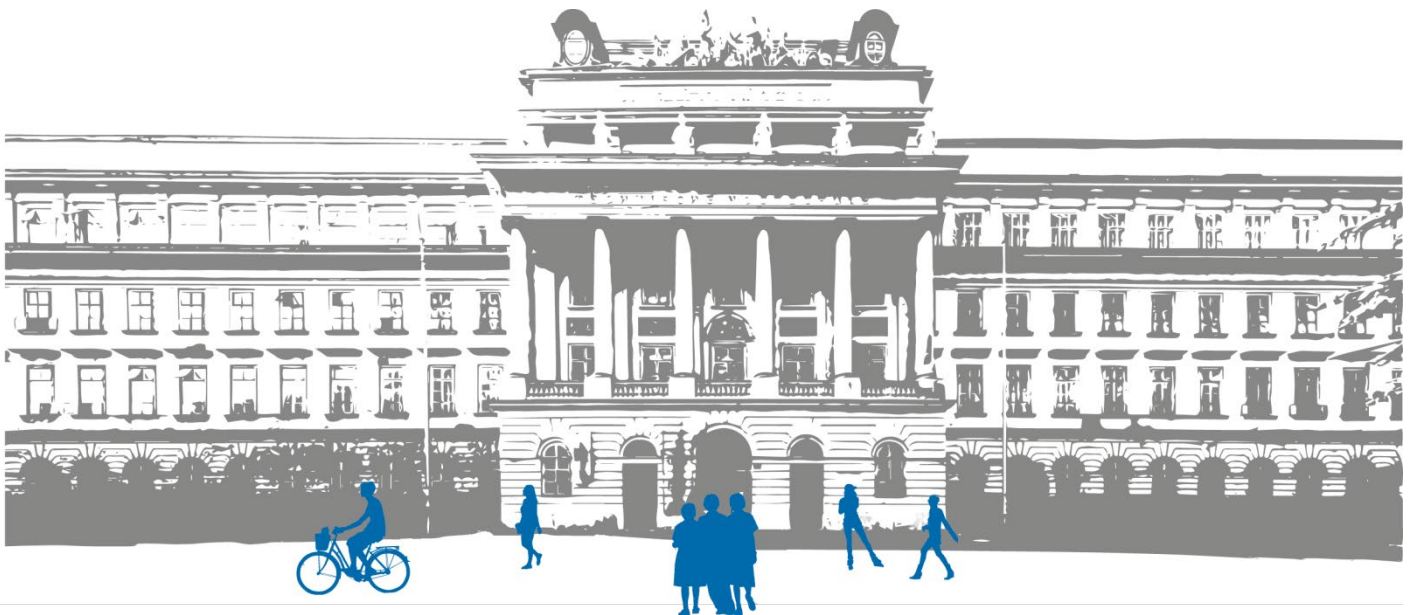
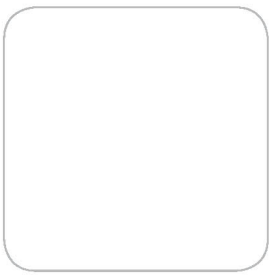


# Development Plan 2019+

## Faculty of Civil Engineering

Science of Building – Building of Science





#### Document history

Version	Date	Changes
1.0	November 2018	External version

# Executive Summary

The present Development Plan 2019+ of the Faculty of Civil Engineering is the result of an extensive, participative discussion process. Based on an in-depth analysis of the initial situation and after defining the principles of development, it contains the main strategic goals of the faculty in teaching, research and organizational development for the next two performance periods until 2025.

The future challenges and necessary developments of the Faculty of Civil Engineering are closely related to current and emerging socio-political, ecological, economic and technological trends.

Our **scientific research** will therefore focus on the following three research priorities, which are the interdisciplinary cross-sectional topics:

- Big Data in Civil Engineering
- Bionics and Green Building
- Risk and Disaster Mitigation

It is our goal to establish new research fields in these areas and promote them internationally as well as to expand our existing expertise and to assume leadership in these fields.

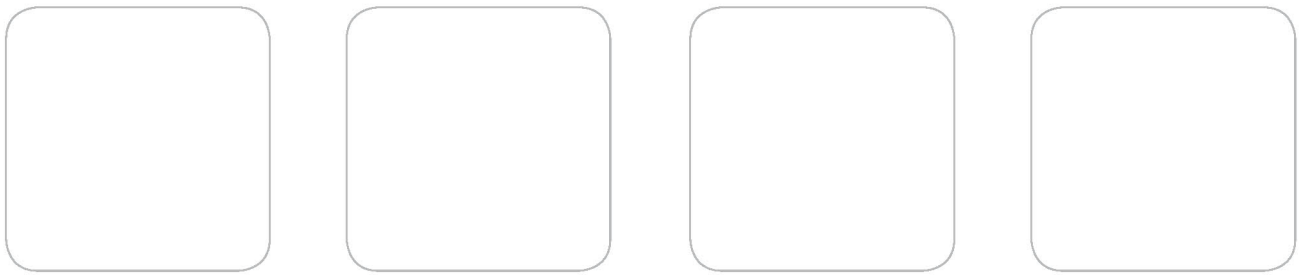
Research-led **teaching** is an essential unique selling point of university education at our faculty and already characterizes the basic structure of the bachelor's program and is consistently implemented in the master's program. In the coming years, the following key development goals will be pursued:

- Digitization of teaching and knowledge transfer
- Increased internationalization through expansion of exchange programs and development of English-language study programs
- Coordination of teaching to improve the studyability of the courses offered
- Expansion of support programs for women, first-year students and talents

In order to achieve the goals in research and teaching, the following essential measures in **personnel and organizational development** are planned:

- Creation of three new §98 and §99(4) professorships in the area of new research priorities, two of them for women
- Modification of the focus in research and teaching of 5 of the 7 §98 professorships to be filled
- First-time establishment of at least two temporary §99(4) (industrial) professorships
- Creation of at least 4 new tenure track positions for excellent academics, half of them for women
- Establishment of faculty research clusters and TU research centers in the new funding priorities to strengthen interdisciplinary research
- Creation of a new institute and 8 new research units

As far as the **spatial infrastructure** is concerned, the faculty will move in the course of the "TU UniverCity" project: all institutes will be joint in the main building at Karlsplatz and the new "Science Center - Phase II" laboratory site will be established.



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# Preamble



We created our Development Plan 2019+ in accordance with the currently valid Development Plan 2025 of TU Wien. We added points that guide us in our faculty's strategical direction and strengthen our priorities. Our mission statement forms the foundation for our Development Plan 2019+. It was worded by all faculty members after intensive and engaging discussions and it precedes the Development Plan below.

Analogous to TU Wien's development plan and due to legal requirements, we consider the two coming performance periods (2019–2021 and 2022–2024) in which the faculty will face substantial strategical and personnel decisions. These decisions depend on financial funds, existing faculty and ongoing infrastructure projects.

Our research aims to continuously develop our scientific unique features and focus on our given strengths. However, in a time of socio-technical change we also have to recognize new developments, expand in the relevant research fields or create new positions, to meet our standard as driver of national and international innovation.

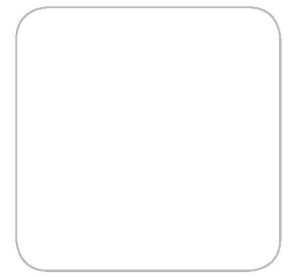
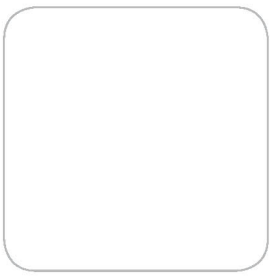
In teaching, we have to ensure that we continue to offer students excellent conditions for their education. The Faculty of Civil Engineering at TU Wien stands for challenging university curricula with research-led courses and high practical relevance. The future viability of the education is to be ensured by supplementing the classical civil engineering subjects especially in those areas which are affected by new technical and social developments.

The research, teaching, organizational and personnel development concepts formulated in this Development Plan take contemporary gender and diversity aspects into account. In this context, the declared goal for the next years is to attract and retain more highly qualified women for academic careers at our faculty and to promote our internationalization.

The concrete implementation of the goals formulated in the faculty's Development Plan must take place through the three-year target agreements between the dean and the rectorate. Their feasibility is thus essentially dependent on the financial and structural framework conditions at TU Wien during this period.

Univ.-Prof. Dipl.-Ing. Dr.techn. Ronald Blab

Dean





# A. Our faculty's mission statement

## **Building Science: Science of building – building of science**

Civil engineers capture, understand, design, calculate, plan and maintain systems in a constant interplay of natural and built environments. In doing so, they assume societal, ecological and economic responsibilities.

At the Faculty of Civil Engineering teaching and research are linked closely and pursued at the highest level. We educate future leaders and advise decision makers on socially relevant issues. Civil engineers thereby play a vital role in improving quality of life and creating a sustainable world in times of change.

Moving beyond the human scale, civil engineers enter both very small scales (e.g. building material optimisation) and very large scales (e.g. transport planning). People are always the centre of our actions, as is proclaimed by TU Wien's mission statement: Technology for people.

As a faculty of TU Wien we commit fully to this statement and pay special attention to gender and diversity competences being introduced, implemented and maintained sustainably on all hierarchical levels of the faculty. Through this, the Faculty of Civil Engineering will continue to support diversity and equal opportunities at TU Wien.

What defines us:

- A culture of mutual appreciation

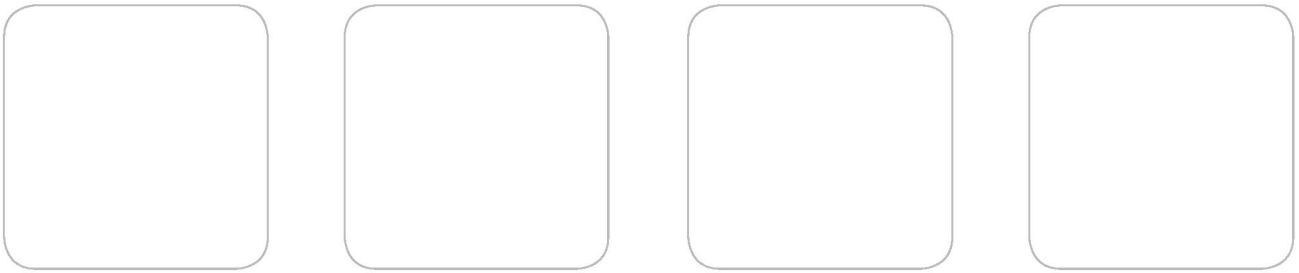
Treating one another respectfully and with appreciation is the basis of our challenging and independent research and teaching duties. We distinguish ourselves by our ability to handle conflicts and build relationships, by bravery, collegiality and knowledge of ourselves and those next to us.

- Applied interdisciplinarity

In a world of ever increasing complexity, we believe interdisciplinarity is an indispensable means to improving our ability of understanding the world. Applied interdisciplinarity is therefore an essential part of our continuing learning process. To this end we continue to expand the spectrum of applications for civil engineering competences and support the emergence of new disciplines in research and practice.

- Building bridges between fundamental research, application and practice

Our research is focused on generating scientific knowledge based on questions arising from engineering practice. We thereby build bridges in our research and teaching between fundamental science and technical applications, which are essential for our societal development. Civil engineers guide this process towards implementation of technical applications in everyday use.



- Pioneers in mathematical modelling

We aim to make the world more calculable, as this was the starting point for civil engineering as a discipline. The increasing influence of mathematics in our society helps us maintain, shape and develop our world, and also further mathematics and natural sciences themselves.

- Fusing experimental and theoretical research

We connect theoretical models, which represent artefacts and processes as modelled reality, with empirical data gathered from measurements from nature and experiments. The latter require theoretical frameworks; and also the nature of the experimental data influences the form of the theory.

- Advancing innovation

We advance innovation and performance processes in civil engineering on the basis of our research-driven focus through the individual skills, expertise and abilities of our employees and students. We thus substantially foster the competitive potentials of domestic enterprises and the construction industry as a whole.

- Leadership in times of technological, ecological and socio-economic challenges

We are profound problem solvers and take on a leading role in a world that is becoming more complex and fast-paced through our technical expertise and academic reputation.

# B. Development of the faculty

## B.1 DEVELOPMENT FUNDAMENTALS

According to the mission statement of the Faculty of Civil Engineering and in full agreement with the values lived at the TU Wien, the development of the Faculty of Civil Engineering is based on the following general principles.

- Freedom of research and teaching

The faculty is fully committed to the constitutionally guaranteed freedom of science, scientific creation and teaching. Research staff are fundamentally free in their choice of research questions, in their methodical approach as well as in the evaluation and dissemination of their research results. The staff members adhere to the rules for safeguarding good scientific practice (Code of Conduct<sup>1</sup>) at the TU Wien. Those who teach are free to design their courses (lectures, exercises, seminars, etc.) in terms of content and method and are entitled to freely express their scientific opinion. However, this does not release them from the obligation to hold courses in accordance with the valid study regulations and to adapt the teaching content to the didactic objectives of the curriculum.

- Trust, esteem and respect

Trust, esteem and respect form the basis of good cooperation at the Faculty of Civil Engineering. Employees can trust in it and actively contribute to mutual trust and respect by treating each other respectfully and observing the rules of appreciative cooperation.

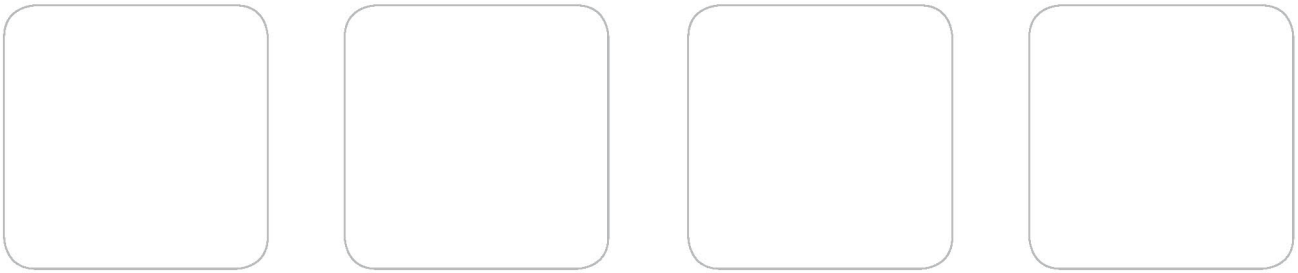
- Excellence in science and engineering

As a representative of an application-oriented engineering discipline, the Faculty of Civil Engineering at TU Wien is committed to excellence in scientific research and research-led teaching as well as to excellence in engineering. The basic prerequisite for excellence is the creative thinking of our staff members. A diligent appointment policy and personnel planning consider the balance of application-oriented engineering performance and fundamental scientific work at the faculty.

In addition to teaching practical application, the university education at the faculty has in particular the claim – based on methods taught in system competences and scientific perspectives – to encourage independent research work. Through the development of research-led teaching, students should learn to approach complex problems of civil engineering and to solve them with scientific methods even beyond the current limits of knowledge.

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<sup>1</sup> Code of Conduct TU Wien, disclosed in Announcement Bulletin 26/2007 (Serial No 257). Available: [https://www.tuwien.ac.at/dle/datenschutz\\_und\\_dokumentenmanagement/richtlinien\\_und\\_verordnungen/code\\_of\\_conduct\\_fuer\\_wissenschaftliches\\_arbeiten/](https://www.tuwien.ac.at/dle/datenschutz_und_dokumentenmanagement/richtlinien_und_verordnungen/code_of_conduct_fuer_wissenschaftliches_arbeiten/)



- Participation and transparency

At the Faculty of Civil Engineering the participatory cooperation of the collegial bodies is realized according to effective university law (UG 2002). Decision-making processes are made transparent through institutional communication within the collegial bodies and between the curia. The participation of the students, especially in study matters and in the quality assurance of teaching, is explicitly supported.

Faculty staff are entitled to participate in decisions that affect them, as well as to secure appropriate working conditions and appropriate access to available resources. The faculty is committed to grading the extent of participation and access to resources according to proven performance and willingness to assume responsibility in the sense of qualification-related co-responsibility. The basis for this is an evaluation carried out on the basis of transparent benchmarks.

- Gender equality and diversity

The Faculty of Civil Engineering is aware of its responsibility with regard to contemporary gender equality and diversity issues and actively supports the advancement of women at TU Wien<sup>23</sup>, and works towards implementing the social equality of gender in all areas.

Our aim is to achieve an appropriate gender balance, especially in management functions and professorships, as there are still significant career differences between women and men. In the pre- & post-doctoral field, in teaching and research as well as in administration and in all collegial bodies, a balanced numerical ratio should be achieved in the medium term.

In order to ensure a consistent implementation of the principle of gender mainstreaming in all decision-making processes and in the planning of all measures relating to personnel and organizational development, the Faculty of Civil Engineering actively involves the Arbeitskreis für Gleichbehandlungsfragen (Working Group for Equal Treatment Issues) and calls in experts as external advisors when necessary.

- Internationality and mobility

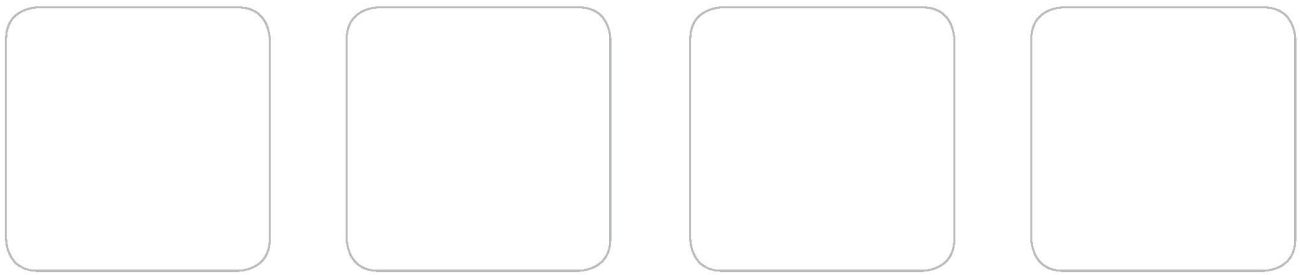
The Faculty of Civil Engineering is committed to the four strategic principles of TU Wien's International Strategy Concept<sup>4</sup>, in particular to promoting the national and international mobility of students, graduates and academic staff. This is to be facilitated in particular by promoting strategic, bilateral university partnerships and by setting regional and thematic priorities. Our faculty values internationally networked and competitive research as an essential characteristic of excellence.

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<sup>2</sup> Plan for advancement of women at TU Wien: <http://www.tuwien.ac.at/dle/genderkompetenz/frauenfoederungsplan/>

<sup>3</sup> Strategies for realization of the plan for advancement of women at TU Wien, Faculty of Civil Engineering, January 2016

<sup>4</sup> TU Wien International – Strategy Concept - Global Strategy 2013\*  
[https://www.tuwien.ac.at/wir\\_ueber\\_uns/berichte\\_und\\_dokumente/](https://www.tuwien.ac.at/wir_ueber_uns/berichte_und_dokumente/)



## B.2 RESEARCH

### Environment and future trends

The future challenges and necessary developments of the Faculty of Civil Engineering must be seen within the narrow context of the current and emerging socio-political, ecological and economic as well as technological framework conditions. The following significant trends are identified as follows:

- *Information society and digitization:* Information and knowledge will become the capital of the future and increasingly determine the competitiveness and prosperity of our society. Digitization is increasingly penetrating every area of the economy and technology. This will also fundamentally change work and production processes in the construction industry.
- *Demographic development:* In the next 20 years, far-reaching demographic developments are to be expected, which will also be clearly visible in the construction of tomorrow. In Austria and Europe, the proportion of people over the age of 60 is growing steadily, resulting in an increased need for new forms of housing, infrastructure, mobility and care, especially in urban agglomerations.
- *Climate and energy change:* The current climate change is scientifically proven and affected by anthropogenic developments. The use of fossil fuels and large-scale deforestation influence the concentration of greenhouse gases in the atmosphere and drives global warming and thus climate change. The building industry must therefore make significant contributions to the expansion of renewable energies, the development of resilient systems and the adaptation of the built environment to the consequences of climate change.
- *Intelligent materials and substances:* Composites, nanomaterials and bionic building materials are becoming increasingly important in the construction industry and are developing into a key technology. A central aspect is the interdisciplinary development of not only high-strength and durable, but also environmentally friendly, recyclable and health-compatible building materials and structures.

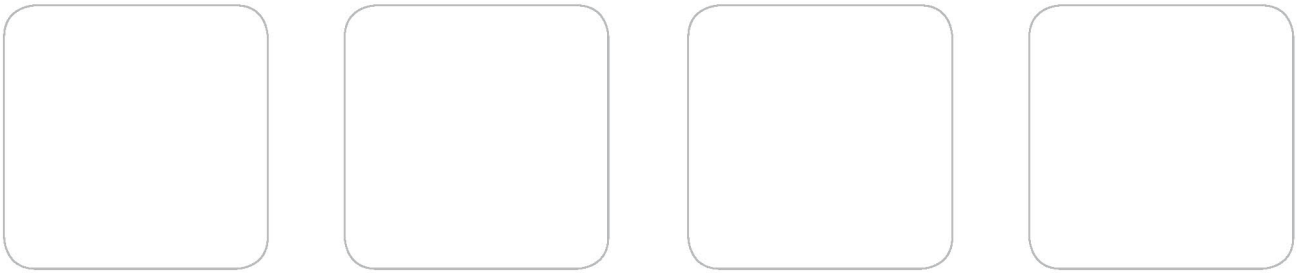
These developments are particularly reflected in the primary research areas of our faculty as well as in the determination of future funding priorities.

### Strategy

The Faculty of Civil Engineering faces these future challenges and wants to assume responsibility. The Faculty of Civil Engineering focuses on safety, eco-friendliness and economic efficiency of buildings as well as the sustainable use of our natural resources.

Our special strength lies in the combination of fundamental and application-oriented research based on the broad professional competence of the scientists working at our faculty and their good national and international networking.

Our faculty will meet future challenges in scientific research with the following fundamental strategies:



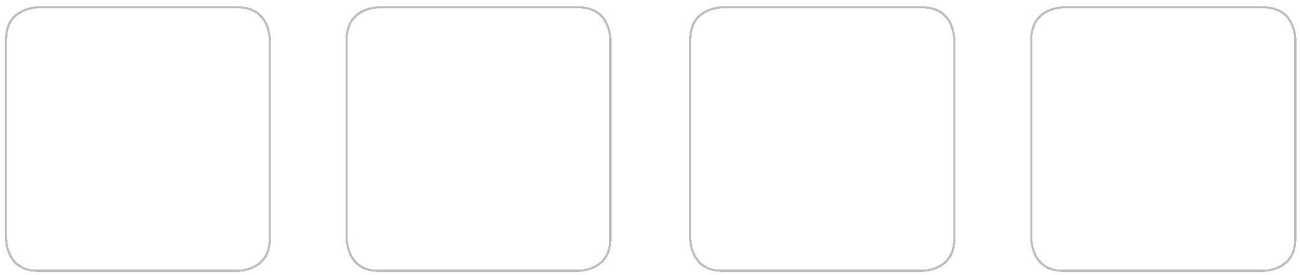
- Promotion and expansion of scientific excellence, interdisciplinarity and internationality in order to enable new innovative approaches and ideas in civil engineering.
- Strengthening of experimental and theoretical fundamental research, as a prerequisite for application-specific developments and their structural and organizational implementation
- Further development of the continuous exchange, cooperation and communication with the public and private sectors as well as with the public, expansion of alumni activities in order to strengthen the transfer of knowledge from the university to decision-makers and to further develop its own position as the primary contact for application-specific research, consulting and further education.

By focusing on these strategic goals in connection with an increased integration of our research into the international scientific community, the successful further development of the faculty's positive research balance will be ensured. This applies both to the fundamental subjects, which are already well integrated internationally, and to all application-oriented research areas.

## Main Research Areas

On the basis of the priorities listed in the Development Plan 2016+ and new accents in research, the following three main research areas will lead the further scientific development and profiling of our faculty (see chart 16). These three main research areas can be assigned to the respective research focal areas of TU Wien (listed below as TUV).

- 1) Modelling in civil engineering  
(TUV: *Computational Science and Engineering*)
  - Development of innovative structural systems
  - Planning, optimization and computational modelling of engineering structures
  - Economic analysis of construction methods, processes and resources
  - Management of construction projects and processes, life cycle analysis (cost and environmental impacts) and construction contract issues
- 2) Smart building constructions and materials  
(TUV: *Material Science and Matter*)
  - Characterization of traditional and biogenic materials and composite materials
  - Development of high-performance materials
  - New materials and bionics
  - Mechanical and building physics fundamentals of material modelling
- 3) Sustainable systems and resources  
(TUV: *Energy and Environment*)
  - Structural and operational concepts for transport infrastructure
  - Condition assessment and monitoring of engineering structures and systems
  - Event forecasting and risk analysis
  - Sustainable water and material cycle management



*Figure 1: Main Research areas of the Faculty of Civil Engineering*

Within the main research areas identified in the Development Plan, selected funding priorities will be defined with the aim of achieving the following objectives:

- Priority funding for the establishment or further development of existing research fields with high relevance
- Promotion and motivation of young excellent scientists
- Establishment and self-financing of the priority field after one to a maximum of two performance periods

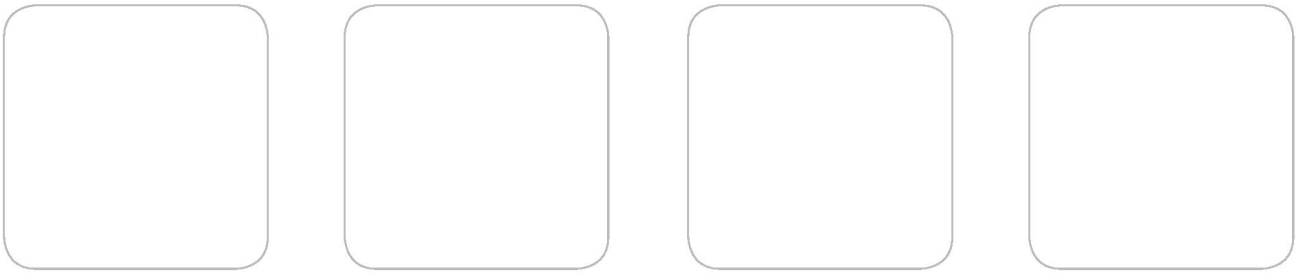
## Funding priorities

In the present Development Plan 2019+, which covers the two performance periods 2019 - 2021 and 2022 - 2024 with an outlook until 2025, the following funding priorities are defined within the framework of the research priorities of the faculty.

### *Big data in Civil Engineering*

The value chain in construction projects (planning, construction and operation) will experience a further productivity boost in the coming years due to digitization and data integration.

The currently prevailing framework conditions of construction projects (e.g. heterogeneous, fragmented company structures, disruptive changes, processes with interfaces and "silo thinking" of the project participants) often result in information loss, collisions, as well as necessary



adaptations due to rescheduling during construction. The result is high costs and loss of time as well as quality. Largely unstructured data formats, inconsistent standards, different types of project presentations and increasing data density from phase to phase contribute to these partially inefficient processes.

The use of digital tools and technologies has enormous potential for improvement, such as:

- Increased process integration
- Optimization of construction projects over the entire life cycle through modelling, simulation of execution management and operating processes
- Creation of integrated data structures along the value chain from project development to termination
- Use of data for urban mining activities

On the one hand, costs and construction time can be reduced, on the other hand, significant quality improvements can be achieved and a sustainable infrastructure can be ensured.

A special research focus will be on the investigation of the use of building information modeling and other digital tools for the automated coupling of planning, design, construction and operation. Another focus will be the investigation and development of simulation tools for prediction, analysis and optimization of the life cycle performance of construction projects in terms of cost, time or eco-efficiency.

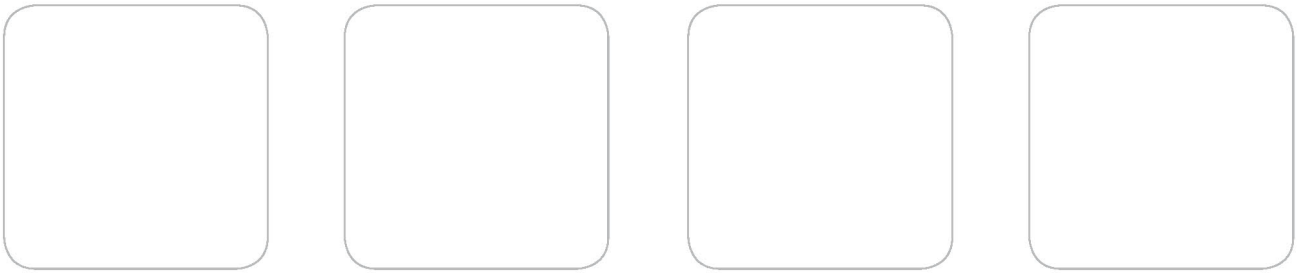
### ***Bionics and Green Building***

Bionics deals with the transfer of phenomena of nature to technology and the associated fruitful interactions: on the one hand, structures and systems occurring in nature can inspire new technical solutions, and on the other hand, technological methods developed by civil engineers can help to better understand, grasp and even computationally represent nature. This understanding is to be strengthened and expanded in the funding priority.

One priority will be set at the interface between civil engineering and medicine, as a new facet of health engineering. The TU-wide initiative "ViCEM - Vienna Center for Engineering in Medicine", in cooperation with MedUni Vienna, also adds to this, whereby "Civil Engineering in Medicine" comprises the development of modern simulation tools for the evaluation of organic structures and systems (e.g. risk of fracture of osteoporotic bones) on the basis of an engineering understanding of the "materials" of biology and their genesis. Their understanding is gained by experiments from civil engineering which are adapted to meet medical challenges in connection with multi-scale theories in engineering science. This complements existing biomedical technologies in image processing and control engineering and thus represents an important building block for the establishment of the "Virtual Physiological Human" as a new instrument in diagnosis and therapy, especially in the fields of traumatology and tissue engineering.

A further priority is set in the area of Green Building. Green building comprises ecological and sustainable building adapted to the environment and its ongoing transitions such as climate change, with special consideration given to the interaction between people and the environment. Maintaining the quality of life, especially in the cities of the future, requires innovative system solutions using multifunctional, sustainable, environmentally compatible but at the same time mechanically robust building materials and technologies. Such solutions include, for example, photovoltaics, the greening of roofs and facades, the use of biological and bio-inspired load-bearing elements and structures, and the use of green elements indoors. This leads to resource conservation, energy efficiency, resilience and healthier living.



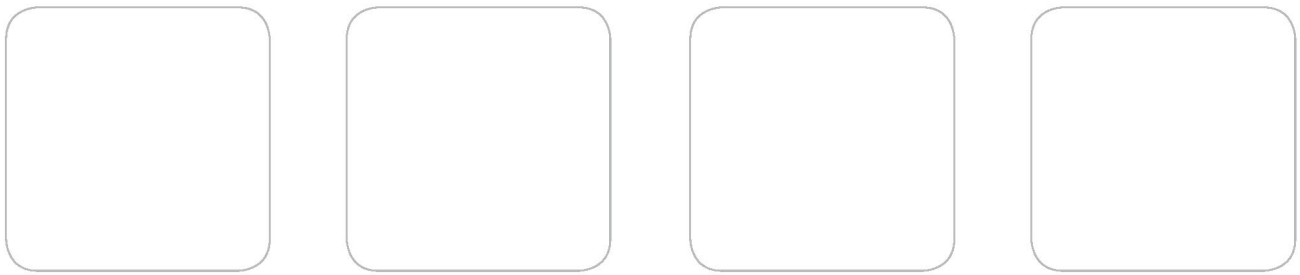


### ***Risk and Disaster Mitigation***

People and infrastructures are threatened by numerous external risks and environmental influences (climate change, earthquakes, floods, epidemics, scarcity of resources, accumulation of pollutants, etc.) that can lead to severe crises. In the funding priority Risk and Disaster Mitigation, approaches are being developed for the foresighted handling of such events which reliably describe the behavior of the overall system, consisting of technical, natural and social components, and expand the understanding of the interactions of these system components. On this basis, models, methods and practically feasible concepts for the design of civil engineering systems will be developed while taking risk into account, and implemented under realistic conditions. These risks are to be recorded, evaluated, avoided or their effects significantly reduced by proactive measures.

The behavior of buildings is monitored with regard to risks over their life cycle, and through ongoing monitoring and assessment of their condition in order to positively influence operating decisions (e.g. closing, repairing or demolishing buildings) within the framework of the adaptive management concept. Concepts and methods are developed which help to ensure a sufficient supply of raw materials in quantitative and qualitative terms. This must also be achieved in an environmentally compatible manner, which requires, for example, the sufficient availability of suitable last sinks and means that a profound understanding of the system is necessary in order to develop counter-strategies for the reduction of risks and impacts of natural hazards. In addition to the relation to the direct use or usability of water by humans, the developed concepts/methods/models serve as a basis for the scientific investigation of aquatic systems. The knowledge gained in this way is used to derive effective and sustainable management measures (e.g. for flood and water resource management). The interfaculty Research Centre (ICC) Water and Health and the FWF Doctoral College Water Management Systems are part of this funding priority.

The funding priority is a cross-cutting topic that brings together various areas of civil engineering, including building mechanics, structural engineering, geotechnics and transport, water, resource and construction industries.



## B.3 TEACHING

### Strategy

First and foremost, our faculty is committed to "research-led teaching", which already determines the basic structure of the bachelor's program: at the beginning, students are taught mathematical, physical, chemical, technical, ecological and economic knowledge in order to be able to handle practical topics in civil engineering.

In the master's program, the knowledge transfer is based on current findings from research and development in order to introduce our students to the methodology of scientific work and the development of innovative solutions for problems in civil engineering.

With respect to research-led teaching, but also in connection with the organizational design of teaching, the university's civil engineering education differs essentially from other educational paths of the tertiary sector. In connection with the organization of teaching, it should be noted that the principle of free transfer of knowledge with a minimum of formal requirements (such as subject-specific access restrictions and compulsory attendance in lectures) is consistently implemented above all in the master's program.

### Development goals

#### *Digitization of teaching*

The methods of knowledge transfer in teaching are currently undergoing fundamental change, which on the one hand is connected with the possibilities of digitization and on the other hand is due to resource optimization. The medium-term goal of our faculty is therefore to make optimal use of the possibilities of digitization, depending on the requirements of the respective courses, by using, among others, the following options:

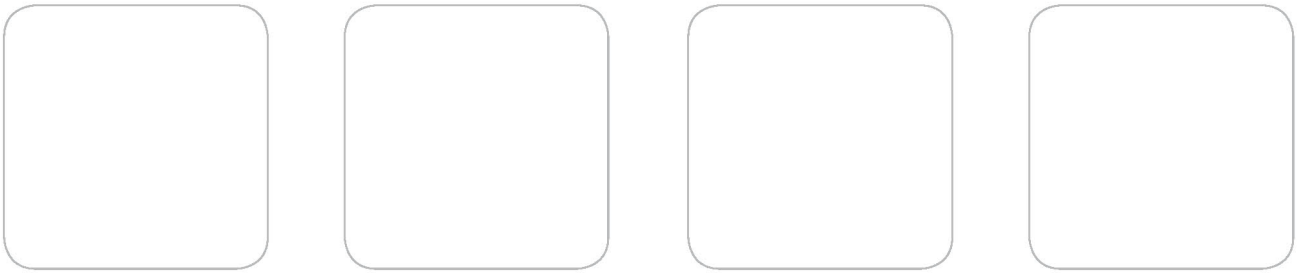
Video streaming, which is already being used in selected lectures with a large number of listeners, is to be implemented across the board as far as possible, above all in order to offer students the opportunity to follow the courses with a time delay if they are unable to attend.

In practical courses, partially semi-automated continuous knowledge checks are offered and short tests are carried out after each exercise block in fundamental subjects. Since the experience with these measures has been positive throughout, such supplements to the practical courses are to be implemented continuously for further subjects, starting with the practical courses of the bachelor's program.

Within the framework of modernization and digitization, individual measures that are planned within the digitization strategy of TU Wien<sup>5</sup> for the "Studium 4.0" will be increasingly incorporated into teaching. However, this is by no means intended to replace the existing range of direct teaching, but rather to be understood as a selective supplement to the synchronous range of

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<sup>5</sup> Published by the Rectorate, Vice Rector for Digitization and Infrastructure:  
[https://www.tuwien.ac.at/en/news/news\\_detail/article/126397/](https://www.tuwien.ac.at/en/news/news_detail/article/126397/)



courses. Particularly in the area of blended learning, the possible media offerings are to be specifically examined for their use and then tested in practical implementation.

In the field of teaching evaluation, positive experiences have already been gained in numerous courses. In addition to a further broadening of the range, work will be carried out in the coming years to improve the quality of feedback.

### *Internationalization of teaching*

One of the main development goals for teaching at our faculty in the coming years will be to broaden the range of courses with regard to studies abroad and to promote the exchange of lecturers.

The medium-term strategy of the faculty pursues several goals:

- Motivation of the students to participate,
- Coordination with industry partners and representatives of the chambers of commerce to optimize the range of offers,
- Expansion of exchange programs, especially with attractive partner universities.

In the context of the promotion and intensification of the cooperation with partner universities, our efforts focus on closer coordination of the course content of the most popular courses in order to avoid problems with crediting in advance. The increase of English-language courses in master's subjects is also planned for the next few years.

In addition, stays abroad are to be given special weighting and evaluation in consultation with the university management in order to compensate for disadvantages resulting from the extension of the duration of study with regard to the awarding of scholarships and prizes.

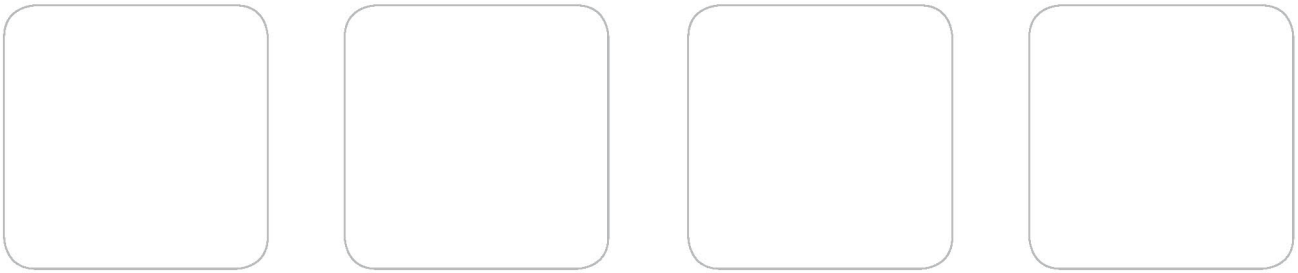
In addition to the expansion of the English-language course offerings, the following measures are intended to make the offerings for incoming students more attractive:

- Combination of several courses in priority areas in terms of time and content, which are specifically offered at the faculty;
- Expansion of the services offered in connection with student counselling and in coordination with the International Office of TU Wien;
- Involvement of interested industrial partners to offer not only university courses but also practical supplements (within the framework of small group excursions, short internships, etc.).

### *Coordination of teaching content*

In the medium term, the teaching materials, which currently vary in their form, are to be harmonized with regard to notations and designations in the sense of European standardization in order to offer students a consistent nomenclature.

It is planned to establish a Teaching Day once a year (preferably in the second half of the summer semester) in which representatives of the research fields and interested students (student representatives) participate. The primary aim of this event is to coordinate the teaching materials and contents in terms of form and content.



### ***Strategy Group Teaching***

In the intensive discussions in the Strategy Group Teaching it was unanimously stated that the very positive external view of the faculty is primarily owed to the high quality of our graduates.

In order to further strengthen this advantage, the previously irregular consultations with representatives of industry, planners and the authorities are to be institutionalized and intensified in order to be able to respond promptly and in a targeted manner to the wishes of the future employers of our graduates.

The coordination of teaching contents with the other leading civil engineering faculties in the German-speaking area is to be supplemented by a critical comparison with the curricula of other universities in Europe and beyond. Thereby on the one hand the possible need for supplementary courses within the faculty's own curriculum may be identified and, on the other hand, the unique selling points of our faculty's teaching can be determined.

### ***Evaluation of (new) curricula – StEOP, Master's program***

In addition to the intensive discussions in the study commission, a process for the annual evaluation of the StEOP (study entrance and orientation period) and the master's program is to be implemented. For this purpose, in addition to the statistical surveys, experience reports of lecturers and students will also be evaluated.

In addition to the evaluation processes which are currently to be revised uniformly for all of TU Wien with the focus on the course evaluation by students, the evaluation by graduates (5 and 10 years after graduation) is to be institutionalized in future. Essential talking points are:

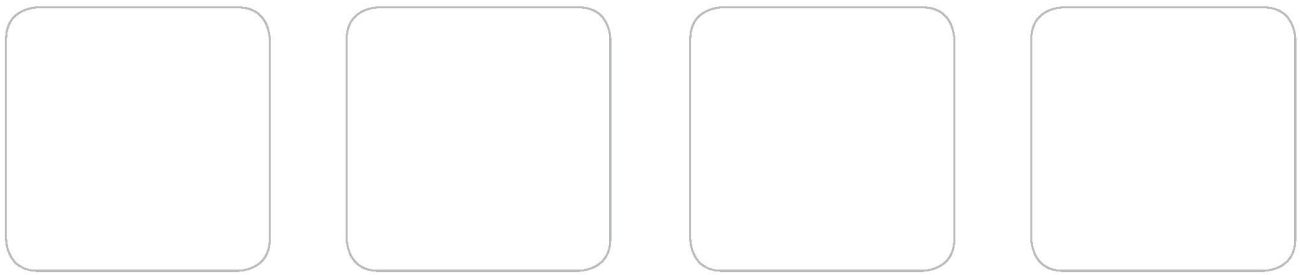
- Field(s) of activity of our graduates,
- Relevance of the completed subjects (groups) and modules for the later professional activity,
- Identification of thematic deficits in the current curricula.

The evaluation of these surveys is an essential input for the consultations of the study commission.

### ***Talent development***

In order to additionally support excellent master's students of the Faculty of Civil Engineering, a specific talent program is to be set up in cooperation with the TU Career Center. As part of the talent promotion program, selected students are prepared for the demands of professional life through internships in participating companies (planners, clients and contractors). This shortens the training phase in companies and provides participants with additional qualifications.

Students will also be able to make early contact with companies and potential employers.



## B.4 PERSONNEL

The ongoing changes in the science system and the legal framework conditions at universities place high demands on the sustainable personnel development of the faculty. The following personnel development measures are planned to achieve our development goals in research and teaching.

### Professorships

An essential requirement for the appointment policy of the Faculty of Civil Engineering is the scientific orientation of the new professorships. This is to be achieved through the appointment of excellent, nationally and internationally networked scientists and research engineers. In addition to the required expert knowledge, leadership and social skills must also be considered in the appointment process. The focus of the professional activities of the new professors must in any case be on the Faculty of Civil Engineering.

Furthermore, the establishment of female professors is a major concern from the faculty's point of view and must be an essential medium- to long-term goal as part of a future-oriented social process. All those responsible have the unanimous understanding that diversity in leadership has a positive influence on culture and that the social and professional skills acquired must be a central concern of the curia.

#### – Period 2018 - 2021

In the period between 2018 - 21 (the current and next performance period), the establishment or replacement of seven professorships, two of them for women, is planned in accordance with § 98 and § 99(4) University Law (UG).

#### – Period 2022 - 2024

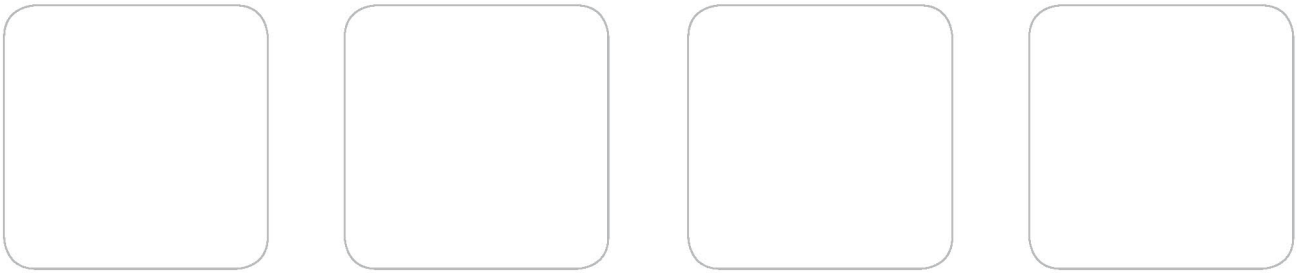
In the performance period 2022 - 2024, five professorships are to be advertised according to § 98 or § 99(4) UG.

Overall, three of the professorships will be advertised for the first time at the faculty in the area of the new research priorities; five of the seven §98 professorships to be filled and reoriented in terms of content.

### Tenure track positions

By establishing career track positions for excellent scientists, the faculty pursues the following fundamental objectives.

- Improved scientific visibility of our faculty by appointing proven researchers
- Opening career opportunities for internal scientific staff (post-docs)
- Development of new research fields at the faculty by filling two to three of the planned career positions with external scientists
- Increasing the proportion of women in the professorial curia
- Springboard for international scientific careers



Candidates must therefore have an excellent scientific reputation in relation to their scientific age and must be internationally visible. The selection process of the candidates and the performance evaluation are carried out by internal and external review according to the valid guidelines of the rectorate<sup>6</sup>.

A habilitation in the respective academic subject must be included in the qualification agreement provided for the career positions. This must meet the requirements for submission to the habilitation at the Faculty of Civil Engineering<sup>7</sup>.

The establishment of four to a maximum of six tenure track positions is planned for the next two performance periods until the end of 2024.

## Scientific personnel

The research assistants financed by the global budget of TU Wien are the basic personnel of the institutes, where they ensure research and teaching activities. In order to maintain and further expand research activities, it is necessary to employ additional research assistants who are financed from third-party funds.

The dean allocates personnel resources for scientific staff to the individual organizational units from the global budget according to the following principles:

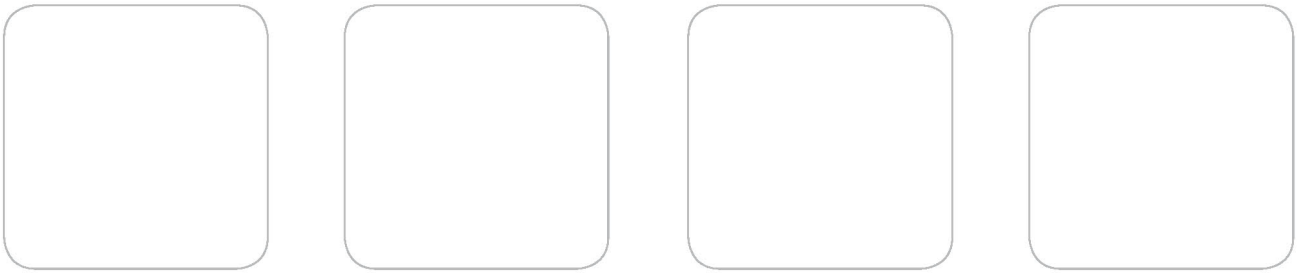
- Ensuring basic staffing of the research centers with temporary pre-doc positions according to research performance and teaching obligation on the basis of a three-year evaluation
- In the medium to long term, organizational units with affiliated laboratory areas in the Science Center are to retain or receive the opportunity to establish a permanent post-doctoral position (senior scientist) to ensure continuous laboratory operations
- Maintaining an appropriate balance between temporary and permanent scientific staff in order to ensure the next generation of scientists in the organizational units
- Allocation of any remaining personnel budget for temporary pre-doc positions via performance agreements with the head of the organizational unit
- Fundamental compliance with the legal framework conditions, in particular the valid chain contract regulation for temporary employment contracts, even if this means that the career model at TU Wien cannot be implemented.

When hiring additional (scientific) staff financed from third-party funds, the responsibility for personnel planning and for ensuring the financial viability lies with the organizational units of the faculty. Employees financed from third-party funds can only be employed on a temporary basis. In particular, the labor law framework conditions must be observed when concluding temporary employment contracts.

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<sup>6</sup> Guideline of the rectorate regarding tenure track positions and qualification agreement, 21.11.2017  
[https://www.tuwien.ac.at/fileadmin/t/tuwien/downloads/VR\\_Pers\\_Gender/Arbeitsrecht/Richtlinie\\_Laufbahnstellen\\_21112\\_017\\_entgeltige\\_Version.pdf](https://www.tuwien.ac.at/fileadmin/t/tuwien/downloads/VR_Pers_Gender/Arbeitsrecht/Richtlinie_Laufbahnstellen_21112_017_entgeltige_Version.pdf)

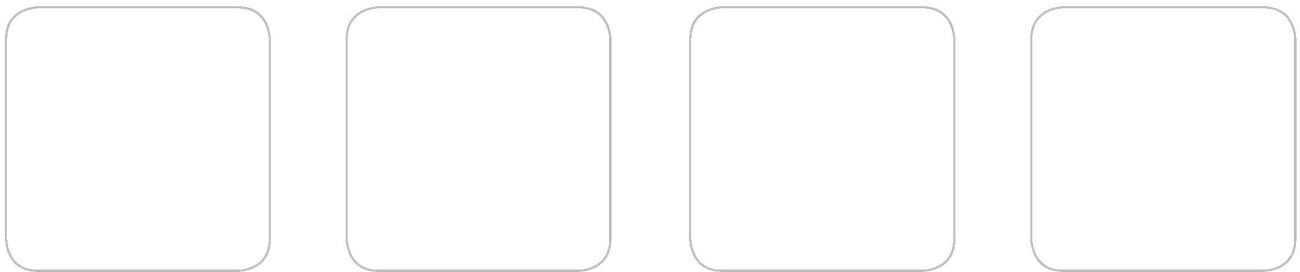
<sup>7</sup> Requirements to achieve the habilitation at the Faculty of Civil Engineering, TU Wien, internal area of the website of the Faculty <http://www.bauwesen.tuwien.ac.at/intern>



## Non-scientific personnel

The non-scientific university staff is one of the main pillars in the administration and laboratory facilities of the organizational units. In recognition of the services to be rendered in this context, the Faculty of Civil Engineering, in close cooperation with the human resources department of TU Wien, strives for a job-related classification and performance-related remuneration of non-scientific personnel.

For determining and further developing job satisfaction, the assessment of previous job goals and results, obligatory employee interviews are to be offered annually as it is for the scientific personnel. The conduct of interviews is included in the evaluation of the organizational units. The professional development of the non-scientific staff is supported by the organizational units and the personnel development of TU Wien in the course of special training offers.



## B.5 ORGANIZATION 2019<sup>+</sup>

### Development of organizational units

As of January 2019, our faculty comprises 8 institutes with 20 research units, the Civil Engineering Services with the Dean's Office, the Civil Engineering Training Centre - bi.f and the Computer Laboratory Civil Engineering (Figure 2).

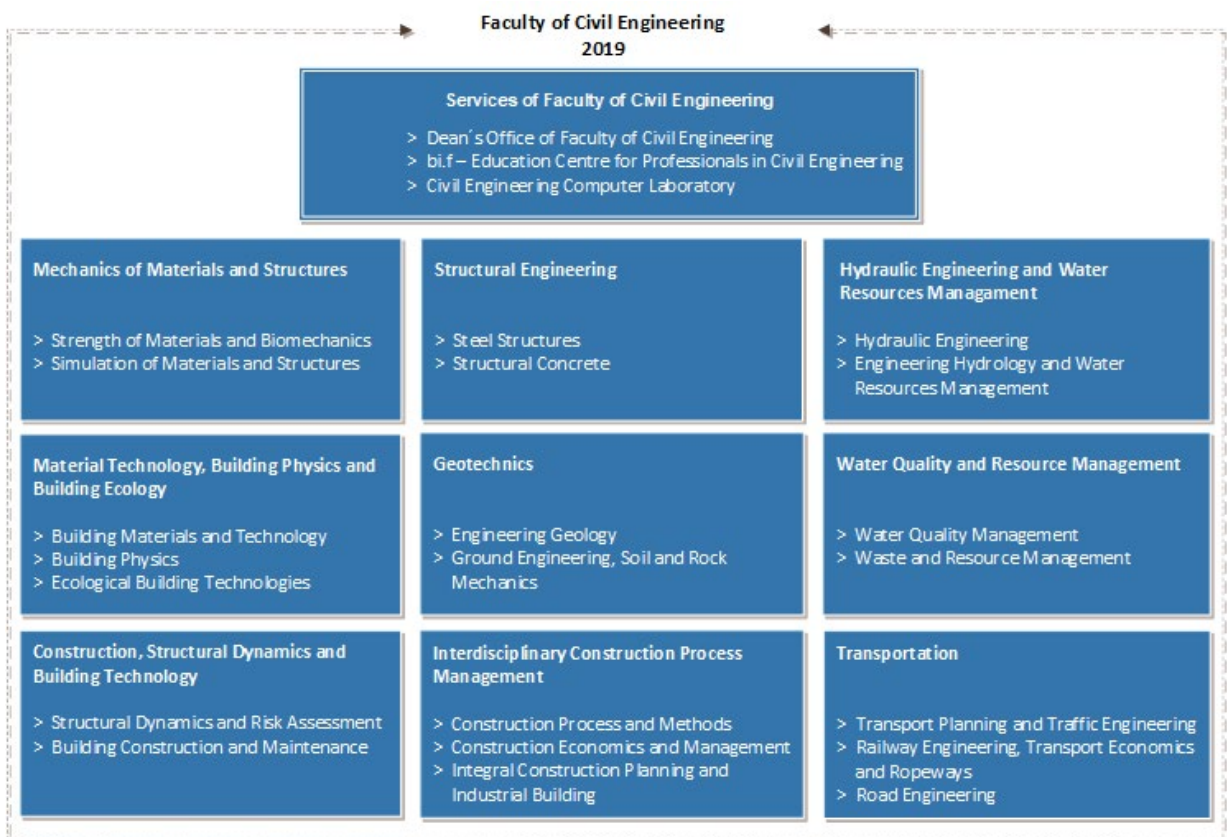
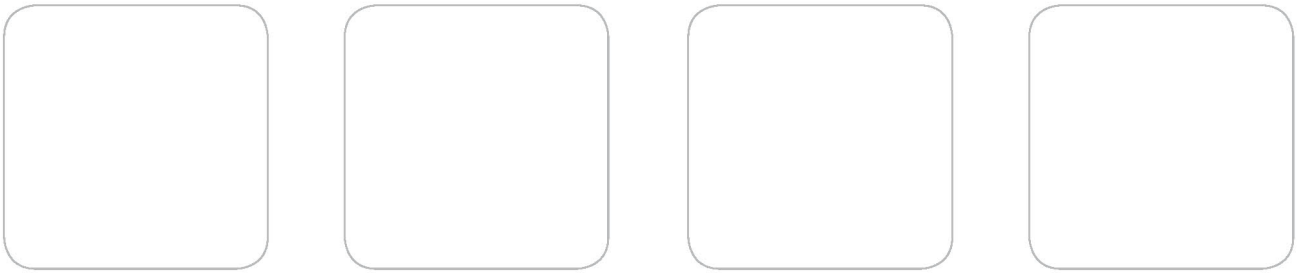


Figure 2: Faculty organizational chart (as of January 2019)

In close connection with the personnel development planned under point B.4, the organization of the faculty with the perspective 2025+ is to be reorganized according to Table 1.

The laboratories of the organizational units will be joint at the new Science Center location, Arsenal II (see B.6 Infrastructure development).





## Research cluster

Parallel to the organizational units, the dean can set up research clusters at the faculty for one to a maximum of two performance periods. These do not appear as separate organizational units.

In a research cluster, research topics within current funding priorities (see B2) of the faculty are researched and financed. The task and aim of these faculty-internal research clusters is to promote interdisciplinary cooperation between scientists from different institutes and research units and to establish innovative research fields at the faculty in the medium to long term. In a research cluster, scientists from at least three research units of different institutes work together and nominate a responsible head.

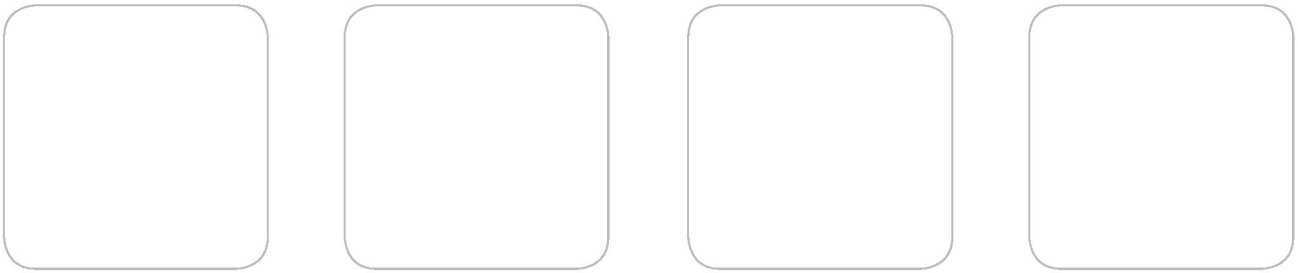
The dean funds research clusters with his own personnel resources and budget funds for innovative projects in connection with performance agreements.

## TU Cooperation Center

The instrument "Inter-faculty Cooperation Center"<sup>8</sup> serves as a springboard for further research cooperation for interdisciplinary and inter-faculty cooperation of research groups at TU Wien, possibly also involving researchers from other universities. In order to promote interdisciplinary research, the participation in such cooperation centers, which are located in the funding priorities of the faculty defined according to B.2, is therefore to be supported and further expanded in the 2019+ period.

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<sup>8</sup> Further information [https://www.tuwien.ac.at/forschung/tuw\\_forschungs\\_foerderung/tu\\_kooperationszentren/](https://www.tuwien.ac.at/forschung/tuw_forschungs_foerderung/tu_kooperationszentren/)



## B.6 INFRASTRUCTURE DEVELOPMENT

In the course of the project "TU UniverCity", TU Wien expands its spatial environment and adapts it to modern requirements. The Faculties of Civil Engineering and Architecture and Spatial Planning will find their home in the main building at Karlsplatz. The Faculty of Civil Engineering will be particularly affected by the two site projects "Safety refurbishment Karlsplatz" and "Laboratory site Science Center - Phase II".

### Safety refurbishment Karlsplatz

From 2016 to 2021, BIG will undertake a comprehensive safety refurbishment in the main building of TU Wien with special consideration of safety technology and fire protection, thus ensuring the continued operation of the Karlsplatz location as a university building for the coming decades.

In the course of this safety refurbishment, the utilization concept will also be revised as part of accompanying measures and the sub-project TU Future Use. The aim is to use the main building as the location for the two faculties – Architecture and Spatial Planning and Civil Engineering – as well as some centralized services.

The Faculty of Civil Engineering uses this period merge the offices of all institutes and to integrate those areas of the faculty which are currently located outside the main building. The planned development of the organizational structure according to C5, Table 1, is already taken into account.

In the course of this restructuring, an objective reallocation of space will also be carried out on the basis of the space key figure model of TU Wien, which also considers the space occupied by the institutes at the new Science Center at the Arsenal.

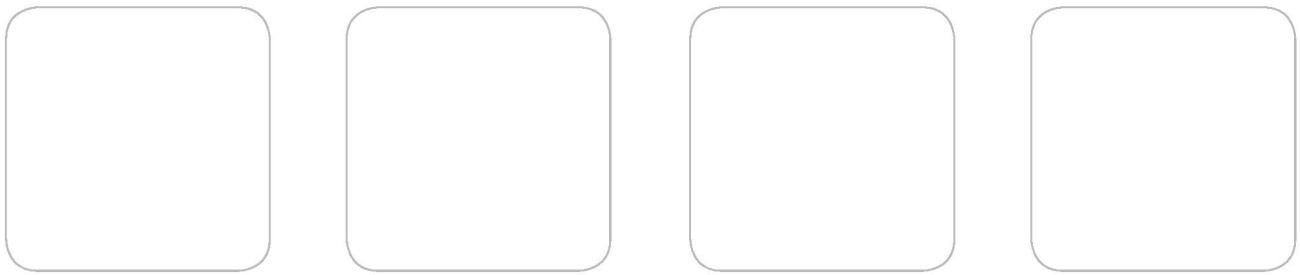
### Laboratory site Science Center – Phase II

The large laboratories of the institutes E 202, E 206, E 222 and E 230, which are currently located on the Aspang site (Adolf-Blamauer-Gasse, 1030 Vienna), will have to yield to the "Eurogate Project" over the next few years and will be relocated to the Science Center at the Arsenal.

In the course of the reorganization of the institute offices at Karlsplatz, the laboratories of the institutes E 206, E 212, E 220 and E 226 will also be integrated into the new Science Center.

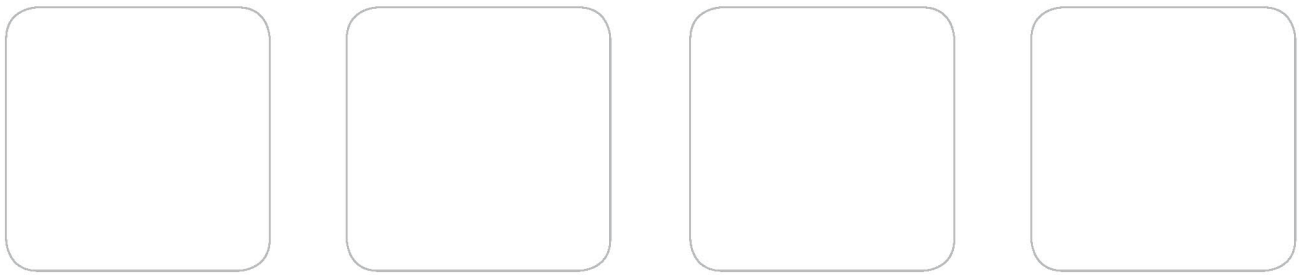
For the institutes E 202, E 206, E 212, E 220 and E 230, a new building with a total area of approx. 8,800m<sup>2</sup>, the so-called "Laboratory Concentration", will be constructed in the area of the intersection Lilienthalgasse/Franz-Grill-Straße, which will be ready for use in 2019. The institutes E 222 with their Hydraulic Engineering Laboratory and the Groundwater Laboratory as well as E 226 will receive a new building on the opposite side of Lilienthalgasse with the new Hydraulic Engineering Laboratory, which is expected to be ready for moving in by the institutes in 2020.

In addition, the institute E 222 operates the Hydrological Open Air Laboratory in Petzenkirchen (<http://hoal.hydrology.at>).



*Table 1: Planned development of the organizational structure of the Faculty of Civil Engineering*

Organizational units as of January 2018		Organizational units 2025+	
Nr.	Name of the institute/research division	Nr.	Name of the institute/research division
<b>E249</b>	<b>Services Civil Engineering</b>	<b>E249</b>	<b>Services Civil Engineering</b>
	Dean's Office		Dean's Office
	Education Centre for Professionals in Civil Engineering bi.f		Education Centre for Professionals in Civil Engineering bi.f
	Civil Engineering Computer Laboratory		
<b>E202</b>	<b>Mechanics of Materials and Structures</b>	<b>E202</b>	<b>Mechanics of Materials and Structures</b>
	Strength of Materials and Biomechanics		Structural Analysis and Experimental Mechanics
	Simulation of Materials and Structures		Strength of Materials and Biomechanics
			Structural Simulation and Timber Engineering
<b>E206</b>	<b>Hochbau und Technologie</b>	<b>E207</b>	<b>Material Technology, Building Physics and Building Ecology</b>
	Building Materials, Material Technology and Fire Safety Science		Building Materials and Technology
	Building Physics		Building Physics
	Mechanics and Structural Dynamics		Ecological Building Technologies
	Building Construction and Maintenance		
		<b>E208</b>	<b>Construction, Structural Dynamics and Building Technology</b>
			Structural Dynamics and Risk Assessment
			Building Construction and Maintenance
			Integrated Building Technology
<b>E212</b>	<b>Structural Engineering</b>	<b>E212</b>	<b>Structural Engineering</b>
	Steel Structures		Steel Structures
	Structural Concrete		Structural Concrete
<b>E220</b>	<b>Geotechnics</b>	<b>E220</b>	<b>Geotechnics</b>
	Engineering Geology		Engineering Geology
	Ground Engineering, Soil and Rock Mechanics		Ground Engineering, Soil and Rock Mechanics
<b>E222</b>	<b>Hydraulic Engineering and Water Resources Management</b>	<b>E222</b>	<b>Hydraulic Engineering and Water Resources Management</b>
	Hydraulic Engineering		Hydraulic Engineering
	Engineering Hydrology and Water Resources Management		Engineering Hydrology and Water Resources Management
<b>E226</b>	<b>Water Quality and Resource Management</b>	<b>E226</b>	<b>Water Quality and Resource Management</b>
	Water Quality Management		Water Quality Management
	Waste and Resource Management		Waste and Resource Management
<b>E230</b>	<b>Transportation</b>	<b>E230</b>	<b>Transportation</b>
	Transport Planning and Traffic Engineering		Transport Planning and Traffic Engineering
	Railway Engineering, Transport Economics and Ropeways		Trackbound Traffic Systems
	Road Engineering		Road Engineering
<b>E234</b>	<b>Interdisciplinary Construction Process Management</b>	<b>E234</b>	<b>Interdisciplinary Construction Process Management</b>
	Construction Process and Methods		Construction Methods and Economics
	Industrial Building and Interdisciplinary Planning		Integral Construction Planning and Industrial Building
	Construction Economics and Management		Digital Construction Process



## B.7 INTERNATIONALIZATION

In the implementation of TU Wien's strategy concept, "TU Wien International"<sup>9</sup>, it is a declared goal of the faculty to further advance internationalization in the coming years. Four directions are being followed according to TU guidelines:

- *International exchange relations with excellent universities:* We plan to select strategic partner universities and establish relations. The process can be supported by concluding partnership agreements at faculty level and by applications for establishing strategic networks (e.g. EU programs). Scientific excellence, thematic/methodological adaptability and development potential are criteria for selection. On this basis, concrete cooperation projects are developed for the formation of strategic research and teaching alliances with top universities.
- *Strengthening an attractive, intercultural research and study environment:* We plan to increase the proportion of English-language courses in the master's curriculum. In the medium to long term, English-language master's and PhD programs are planned. In addition, joint courses are to be established with the strategic partner universities, such as summer schools, or, if appropriate, master's programs and PhD programs.
- *International mobility of students and academic staff:* International mobility should be further pursued and strengthened. Building on the existing networks for scientific staff, the existing exchange programs, and future partnership agreements with strategic partner universities, the mobility of lecturers and the exchange of doctoral students is to be increased in the medium term.
- *Improvement of international competitiveness, visibility, and marketing abroad:* An important component of the promotion of internationality is the increased awareness of the importance of internationally networked and internationally competitive research within the faculty. It is planned to promote "international competitiveness", "international visibility" and "foreign marketing" through various incentives in order to increase and improve activities in this direction at the faculty.

These four directions will be further elaborated on in a faculty-specific internationalization concept, taking into account TU Wien's strategy. For this purpose, a working group will be established at the faculty. A faculty representative for international affairs ensures a targeted flow of information within our faculty, between the faculty and the rectorate as well as to the central services for international affairs of TU Wien.

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<sup>9</sup> TU Wien International – Strategy Concept - Global Strategy 2013+  
[https://www.tuwien.ac.at/wir\\_ueber\\_uns/berichte\\_und\\_dokumente/](https://www.tuwien.ac.at/wir_ueber_uns/berichte_und_dokumente/)



# C. Directories

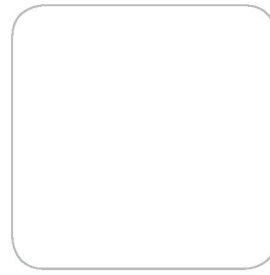
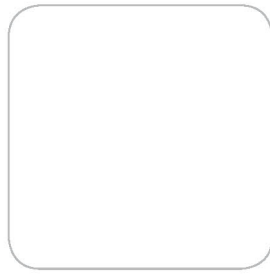
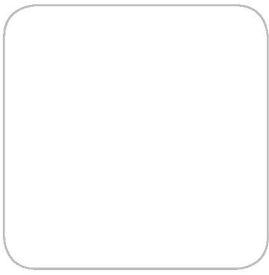
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