Bauhaus-Universität Weimar

CIVIL ENGINEERING

Civil Engineering
[Structures Environment
Building Materials]

Civil Engineering

Building Material Engineering

Management
[Construction Real Estate Infrastructure]

Natural Hazards and Risks in
Structural Engineering

Environmental Engineering

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WELCOME FROM THE DEAN

For us civil engineers, the world is our sandbox! Back when we were children, it was about having fun with shapes and forms. Today, it's about designing living environments in a responsible, forward-looking manner with traditional and innovative civil engineering methods, using the latest technology to construct useful structures. Construction means creatively solving challenging tasks in various ways. Few scientific disciplines are so wide-ranging and offer such occupational diversity, professional opportunities and specialisation. For men and women!
Our work involves constructing, evaluating and controlling masses, forces, strains and shocks, planning, monitoring and managing. Our work ranges in scale from the molecular to the global – from developing new materials, modelling and simulating complex processes, carrying out large construction projects, all the way to controlling the forces of nature. Our task is to address the future challenges of structures, mobility, water and waste, and to an increasing degree, energy efficiency and resource conservation.

Are you interested in learning about these issues and making them the focus of your professional future?

With numerous bachelor's and master's degree programmes, we offer you a solid scientific education which provides far more than pure knowledge. During the basic study phase, you not only gain orientation and perspective, but also the chance to concentrate in an area of personal interest so that you have the necessary skills to venture ahead on your career path. We in Weimar are best equipped to accomplish these tasks and look forward to working with curious and committed young people.

Prof. Dr.-Ing. Karl Josef Witt
Dean of the Faculty of Civil Engineering

WELCOME AT THE FACULTY OF CIVIL ENGINEERING

Over the course of almost six decades, the Faculty of Civil Engineering has been building the future for the future. During this time, we have trained numerous outstanding graduates who have had a lasting impact on the development of our cities and rural areas. Their contributions range from designing innovative waste-water concepts for developing countries, new high-tech building materials for resource-friendly construction, novel energy-saving renovation methods and bridge construction which has helped bring people closer together.

We at the Faculty of Civil Engineering at the Bauhaus-Universität Weimar offer ideal conditions for prospective civil engineers. At our faculty, Structural Engineering, Statics, Mechanics, Mathematics, Computer Science, Natural Sciences, Environmental Technology, Traffic Planning and Building Materials Science are all assembled under one roof. The result is a unique, complex structure of teaching and research unlike any other in Germany.

Our roots go back to 1953 when the faculty of Civil Engineering was established at the former "College of Architecture and Civil Engineering". Structural Engineering, Municipal Underground Engineering and other subjects were taught at the faculty until the 1990s. The university underwent major restructuring from 1991 to 1996, during which time the faculties of Building Material Processing Technology and Computer Technology and Data Processing were integrated into the Faculty of Civil Engineering. This allowed the faculty to offer technical orientation in a broad range of subjects.

No other faculty in Germany offers such a unique combination of subjects. This enables us to respond quickly to changes in the economic sector and modify our educational and research profile accordingly. This is also reflected in our degree programmes: Civil Engineering [Structures Environment Building

Materials], Building Material Engineering, Management [Construction Real Estate Infrastructure], and Environmental Engineering. The focus of instruction is on project study, or in other words, a practice-oriented, interdisciplinary and comprehensive examination of a subject-related problem. Our well-equipped laboratories, computer pools and seminar rooms offer ideal conditions for attaining an excellent education. Approximately 1,000 students are supervised by a diverse group of professors and junior professors. The high teacher-student ratio and other positive factors contribute greatly to creating a productive working environment.

Throughout their degree programmes, our students benefit from our strong national and international network of contacts. With over 20 international partner universities and intensive cooperative programmes, we offer students a wide range of opportunities to study and research abroad. The faculty's strong international character is also reflected in the English-language master's degree programme "Natural Hazards and Risks in Structural Engineering", established in 2010.

All the bachelor's and master's degree programmes at the Faculty of Civil Engineering have received full accreditation by quality assurance institutes – in itself, a distinction of excellence.

Build your own future – at the Faculty of Civil Engineering!

For more detailed information about the degree programmes offered by the Faculty of Engineering, please visit: **www.uni-weimar.de/civilengineering**.

DEGREE PROGRAMMES OFFERED BY THE FACULTY OF CIVIL ENGINEERING

Undergraduate degree programmes
(degree Bachelor of Science, duration of study 6 semesters)
_ Civil Engineering [Structures Environment Building Materials]
_ Management [Construction Real Estate Infrastructure]

Master's degree programmes
(degree Master of Science, duration of study 4 semesters)
_ Civil Engineering
_ Building Material Engineering
_ Environmental Engineering
_ Management [Construction Real Estate Infrastructure]
_ Natural Hazards and Risks in Structural Engineering

Doctorate
_ Doctoral programme (Dr.-Ing., Dr. rer. nat.)

WEIMAR FOR STUDENTS

In Weimar, there is a long tradition of venturing in new directions. In awareness of the great historic accomplishments – Classicism, Bauhaus, German democracy – student life in Weimar is also anchored in its own contemporary microcosm.

The cultural spectrum of the city is comprised of numerous small organisations, e.g. the student union in M18, the university gallery »marke.6«, the student-initiated soap box derby SpaceKidHeadCup, and large institutions such as the Klassik Stiftung Weimar, the Deutsches Nationaltheater and the ACC Galerie. Every two years, the Faculty of Civil Engineering organises the popular concrete-boat christening ceremony at the outdoor swimming pools at the Schwanseebad. Four cinemas, several small theatre venues, over 20 museums and diverse student clubs and concert events further enhance Weimar's reputation as a European capital of culture and contribute to an exciting and eventful student life.

When you come to Weimar, you immediately notice its familiar, small-town feeling. Most places are close by and can be quickly and comfortably reached by bike or on foot. For more information about the opportunities awaiting you in Weimar, please visit: **www.uni-weimar.de/weimar-for-students**.

»Weimar is large enough for you to hide yourself away, but small enough so you don't lose your way.« (Cornelius Lüdtke 5th semester, Civil Engineering bachelor's degree programme)

»Weimar is … simply Weimar. Small, cosy and familiar. What I especially like about studying in Weimar is that it doesn't have that anonymous university atmosphere. That's why the conditions for studying are so good here. And the instructors are always available if you have any problems.« (Sebastian Zander 5th semester, Management [Construction Real Estate Infrastructure] bachelor's degree programme)

CIVIL ENGINEERING

»Structures of civil engineering represent the foundation of development for all human cultures. From ancient canals or viaducts to Gothic cathedrals to the massive bridges of modern times, their history is simply breath-taking. The challenges of sustainable, resource-efficient development demand new complex solutions in all areas of technology, and in particular, the field of construction. When we build, we directly impact our natural environment. Errors or incompetence can lead to developments which can cause problems for generations to come. An exceptionally trained civil engineer finds satisfaction in structures which endure for many years and thus demonstrate the excellence of his/her achievement. The civil engineering profession is one of great responsibility. Not only does it offer professional fulfilment, but the chance to create long-lasting structures. Every successive development in society, every necessary technical and desired innovation requires the active and professional contribution of highly qualified civil engineers.«
(Prof. Dr.-Ing.habil. Frank Werner, Head of the degree programme)

Are you interested in tackling new, creative challenges, such as designing computer-aided simulations, tunnels through mountains or breath-taking bridges? Do you enjoy scientific and technical subjects and like working with numbers and technical equipment? Then come to Weimar!

The department of Civil Engineering offers you the following degree programmes:

_ B.Sc. in Civil Engineering [Structures Environment Building Materials] (standard period of study 6 semesters) with specialisation in:
  _ Structural Engineering
  _ Environmental Engineering
  _ Building Material Engineering
_ M.Sc. in Civil Engineering (standard period of study 4 semesters)

For more information, please visit: **www.uni-weimar.de/civilengineering**.

BACHELOR'S DEGREE PROGRAMME CIVIL ENGINEERING [STRUCTURES ENVIRONMENT BUILDING MATERIALS] (B.SC.)

The first four semesters of the Bachelor's Degree Programme in Civil Engineering [Structures Environment Building Materials] introduce you to the skills and methods of the field, which you will then use in the fifth and sixth semesters to focus on one of the three areas of specialisation: Structural Engineering, Environmental Engineering or Building Material Engineering. Regardless of which area of specialisation you choose, you will gain knowledge and skills for your professional life, in order to plan and design, construct and organise and shape our built environment. You will acquire a quality academic professional qualification and can pursue the areas of specialisation in the appropriate Master's degree programmes.

For more information, please visit: **www.uni-weimar.de/civilengineering**.

What does the programme offer?

The standard duration of the programme is six semesters. In the first four semesters, you learn the fundamentals of the field, in particular mathematics, geodesy, building physics, chemistry for civil engineers, computer science in civil engineering, mechanics/statics, materials science, steel construction, timber construction and masonry, reinforced concrete construction, soil mechanics, construction engineering and business economics. In addition, we place great value on practical application during studies and offer real, substantial exercises, practical work and excursions.

When you enrol in the programme, you choose one of the three areas of specialisation- Structural Engineering, Environmental Engineering, or Building Material Engineering – which you will then study in the fifth and sixth semesters. It is possible to change your area of specialisation during the first four semesters.

In the area of specialisation of **Structural Engineering**, you will learn about reinforced concrete- and prestressed concrete construction, steel- and composite construction, sustainable construction, or the fundamentals of Finite Element Method (FEM). A significant pillar of the degree programme is the project-based course. The goal of the project-based course is a practical, holistic, interdisciplinary examination of constructions and their life-cycles in tandem with the acquisition of discipline-specific key qualifications, such as technical drawing, library research, scientific methodologies, presentation techniques and rhetoric. Working closely with academic staff, you will accomplish demanding and innovative planning tasks. The work you will complete on topics related to current research in the advanced semesters will prepare you as well for Master's degree programmes.

In the area of specialisation of **Environmental Engineering**, you will gain a more profound understanding of the core topics of this field. The core content includes the fundamental subjects of technical infrastructure, such as waste management and biological chemical process engineering, urban water management, traffic and foundation engineering. You will be trained as engineers responsible for conceptual planning, technical coordination of processes, and their respective technologies in the discipline of Urban Areas.

In the area of specialisation of **Building Material Engineering**, you will acquire the fundamentals of materials science, chemical analysis of materials, engineering petrography and mineralogy, timber and asphalt, metals and glass, ceramics and structural ceramics. We offer the ability to work independently in well-equipped materials-, chemistry- and physics labs and a comprehensive education in the areas of construction and raw materials. Core instructional content includes notable characteristics, processing options, and areas of application of raw materials such as metal, glass, ceramics, timber and synthetic materials, as well as knowledge about construction materials, such as binding agents (cement, plaster,

asphalt), rocks, mortar and concrete. Lectures are supplemented with practical training, in which you test materials using the most up-to-date methods and learn various analytical technologies, such as scanning electron microscopy (REM/ ESM) and light microscopy, optical and acoustic particle size analysis, infrared spectroscopy, and chemical analyses.

You must complete a 12-week internship, before or during studies, as part of the Bachelor programme [Structures Environment Building Materials]. You may complete the internship abroad or in Germany. As a rule, the internship must include six weeks' work on a construction site and in an engineering firm. Completed vocational training in a main construction trade or secondary construction work is accepted.

In the sixth semester, you will complete your studies with a Bachelor's thesis, which is bound with current research projects in the Faculty of Civil Engineering. You will receive competent and intensive mentoring.

How do I apply?

If you are interested in technology, have a good grasp of mathematics and physics and have a university entrance qualification, you meet all the requirements for admission to this Civil Engineering degree programme. There are no admission restrictions. In order to help you choose the programme that is best for you, we have developed an online test. The test results remain anonymous and merely assist in self-assessment. They have no influence on registration.

Students may only begin the Civil Engineering bachelor's degree programme in the winter semester. For current information on application and enrolment deadlines and the possibility of applying online, please visit: **www.uni-weimar.de/online-application**. If you have any other questions, please feel free to contact our faculty advisors at: **fsb.bi@bauing.uni-weimar.de**.

And after my studies?

As a structural engineer, you design the construction environment in an efficient and sustainable manner. You plan, design, construct and assemble buildings and structures.

Our graduates are active in:
_ Construction companies and engineering offices
_ State and municipal administrative authorities
_ Energy and water management companies
_ Industrial and commercial firms
_ Housing construction companies
_ Companies and institutions in the environmental sector

In Germany or abroad, a Bachelor's degree in Civil Engineering [Environmental Engineering] opens up a variety of interesting professional fields, particularly in the fields of water and energy supply, waste and waste water disposal, urban and regional planning, transportation and mobility.

Graduates are qualified for employment in the following areas:
_ Engineering and planning offices
_ State and municipal administrative authorities
_ Foreign-aid organisations
_ Utilities and waste disposal companies
_ Universities and Research institutes
_ Service providers in the field of urban development and city management

Building materials science engineers are needed in the development, manufacture and production of construction- and raw materials.

Our graduates are qualified to perform a variety of tasks, such as:
_ Research and development in the entire field of building materials
_ Production of building materials and the technology to manufacture them
_ Building material testing, certification and quality assurance in construction
_ Consulting in building materials and construction
_ Building renovation
_ Damage assessment and causal research
_ Recycling and environmental protection
_ Management and controlling in the field of building materials

After successfully completing the bachelor's degree programme, students may apply for admission to the consecutive master's degree programme in Civil Engineering, Building Material Engineering or Environmental Engineering at the Bauhaus-Universität Weimar, or another subject-related master's degree programme.

MASTER'S DEGREE PROGRAMME CIVIL ENGINEERING (M.SC.)

This master's degree programme expands on the subject-relevant skills taught in the preceding undergraduate programme and provides students with scientifically based, interdisciplinary knowledge and methods. Graduate are qualified to carry out high-level engineering tasks in managerial positions in planning, constructing and finishing structures. In this intensively supervised, research-oriented programme, you have the opportunity to specialise and gain advanced professional expertise.

For more information, please visit: **www.uni-weimar.de/civilengineering**.

What does the programme offer?

The standard period of study for this master's degree programme is four semesters. In the basic-study modules you learn general mathematic-scientific fundamentals and subject-specific content. Our compulsory elective modules include a wide range of subjects, enabling you to hone your skills and specialise in an area of interest. Additional elective modules allow you to attend any courses offered at the university which interest you, for example, language courses or design seminars in the Faculty of Architecture.

You can expect a well-rounded education, comprised of scientific and practice-oriented courses and may choose between two areas of specialisation: Construction Engineering, which covers civil engineering with application in industrial-, public-, bridge-, tunnel, and special-purpose construction, or the interdisciplinary specialisation Archineering. Here, civil engineering students expand their abilities by working on project modules in the Faculty of Architecture to accomplish creative, drawing- and practical design-oriented tasks.

As part of the programme's international orientation, several courses are taught exclusively in English. Furthermore, you may receive credit for coursework completed abroad if it is relevant to your degree programme.

During the fourth semester, you are required to write a master's thesis, supervised by a faculty member. The thesis should adequately demonstrate your ability to work in a scientific manner. After successfully completing and presenting your master's thesis, you will be awarded a »Master of Science« (M.Sc.) degree from the Faculty of Civil Engineering.

How do I apply?

If you wish to deepen your knowledge of Civil Engineering after receiving your bachelor's degree, then definitely apply for admission to a master's degree programme at the Bauhaus-Universität Weimar.

The requirements for admission include an above-average final grade in a Civil Engineering bachelor's degree programme or subject-related first-level university qualification, for example, in a Civil Engineering subject or other technical-scientific subject. In some cases, applicants are required to complete an aptitude test and interview with the admissions board.

Students may begin the Civil Engineering master's degree programme in either the summer or winter semester. For current information on application and enrolment deadlines and the possibility of applying online, please visit: **www.uni-weimar.de/online-application**. If you have any other questions, please contact our faculty advisors at: **fsb.bi@bauing.uni-weimar.de**.

And after my studies?

Well-trained civil engineers are in high demand in Germany and abroad. In their specialised fields, they are capable of analysing problems and offering solutions in an innovative, efficient and creative manner.

They frequently find employment at:

_ Construction companies and engineering offices
_ State and municipal administrative authorities
_ Energy and water management companies
_ Industrial and commercial firms
_ Housing construction companies
_ Companies and institutions in the environmental sector
_ Universities, colleges and universities of applied sciences
_ Non-university research institutes

A successful, above-average completion of the Master's degree programme lays the foundation for admission to a doctoral programme here or abroad.

BUILDING MATERIAL ENGINEERING

»What could be more exciting than researching and developing a wide variety of building materials? Whenever I talk with graduates from Weimar, they always say things like ›Studying building materials was the best decision I ever made.‹ or ›A building materials engineer … is a specialist in high demand, he has every opportunity to work in developing and applying building materials.‹ «
(Prof. Dr.-Ing. Andrea Dimmig-Osburg, Head of the degree programme)

Are you brimming with ideas of what materials in the future might look like? Can you imagine yourself carrying out high-tech tests at a small scale and influencing long-term building at a large scale? Then come to Weimar!

You can earn a master's degree in Building Material Engineering (duration: 4 semesters) at the Bauhaus-Universität Weimar.

For more information, please visit: **www.uni-weimar.de/civilengineering**

MASTER'S DEGREE PROGRAMME BUILDING MATERIAL ENGINEERING (M.SC.)

Increasing demands on modern construction, renovation, environmental protection, recycling and waste-product usage require materials with custom-made characteristics. For materials scientists in the construction sector, this requires the ability to think beyond one's area of expertise. In the Building Material Engineering master's degree programme, we offer you a wide range of opportunities to do just that. With its solid foundation of theoretical knowledge and practical application in a creative academic atmosphere, you will leave the programme with excellent career opportunities.

For more information, please visit: **www.uni-weimar.de/civilengineering**

What does the programme offer?

The schedule of the four-semester master's degree programme focuses not only on the engineering sciences, but also the natural sciences. For example, instructional content includes durability, damage mechanisms of building materials, diagnoses of structural damage, and the possibilities of corrective maintenance and reclamation, as well as the interaction between structure and characteristic of construction- and raw materials. You will acquire skills in testing and analysis technology as well as perspectives on environmental protection in recycling and construction- and raw materials. In practical work and experimentation, you will analyse and test construction- and raw materials, mostly independently. As part of the compulsory and free elective modules, you may select courses from the Faculty of Civil Engineering, as well as other faculties or the Language Centre. This enables you to further specialise in your desired

area of interest. In your master's thesis, you must demonstrate your ability to scientifically evaluate and discuss a current issue of relevance in the area of construction research.

How do I apply?

To be eligible for admission, you must have attained a Bachelor of Science (B.Sc.) degree in Building Material Engineering or Civil Engineering. Graduates with other degrees may be admitted following an individual assessment by the examination committee. Students may begin the programme in either the winter or summer semester. Application is possible through the online portal of the Bauhaus-Universität Weimar at **www.uni-weimar.de/online-application**. If you have any other questions, please contact our faculty advisors at: **fsb.bsiw@bauing.uni-weimar.de**.

And after my studies?

Building material engineers are versatile and often work as intermediaries at companies, institutes and planning offices. The Master of Science degree in Building Material Engineering qualifies candidates for managerial positions in testing, research and development. This entails supervising co-workers, developing, executing and monitoring projects, as well as writing research and test reports.

Building material engineers are qualified to perform a variety of tasks, such as:

_ Research and development in the entire field of building materials
_ Production of building materials and the technology for manufacturing them
_ Building material testing, certification and quality assurance in construction
_ Consulting in building materials and construction
_ Building renovation planning
_ Qualified damage assessment and causal research
_ Recycling and environmental protection
_ Management and controlling in the field of building and construction materials
_ Controlling and project management in the entire building material sector

A successful, above-average completion of the Master's degree programme lays the foundation for admission to a doctoral programme here or abroad.

MANAGEMENT [CONSTRUCTION REAL ESTATE INFRASTRUCTURE]

»I know from experience, that interdisciplinary competence is a much appreciated skill especially in the construction, real estate and infrastructure sector. During my own studies, I had to complete two additional Diploma courses at two different faculties in order to acquire the knowledge in civil engineering and economics that I needed. Today, our students can explore all these topics in one degree programme: Management [Construction Real Estate Infrastructure]. This programme focuses not only on the construction process itself but also on the usage of our built environment. Therefore, our graduates are in many respects highly trained generalists.« (Prof. Dr.-Ing., Dipl.-Wirtsch.-Ing. H. W. Alfen, Head of the degree programme)

Do you find it fascinating to manage buildings throughout their entire life cycles and be involved in planning, constructing, financing, maintaining and operating them? Do you want to work in an interdisciplinary manner and learn to see buildings as complex, holistic systems? Then come to Weimar!

The department of Management [Construction Real Estate Infrastructure] offers you the following degree programmes:

_ B. Sc. in Management [Construction Real Estate Infrastructure] (standard period of study 6 semesters)
_ M. Sc. in Management [Construction Real Estate Infrastructure] (standard period of study 4 semesters)

For more information, please visit: **www.uni-weimar.de/civilengineering**.

BACHELOR'S DEGREE PROGRAMME MANAGEMENT [CONSTRUCTION REAL ESTATE INFRASTRUCTURE] (B. SC.)

Enormous changes in our environment and society have had a significant impact on our »built environment«. To meet a growing number of demands, this built environment has become in many ways more intelligent and complex. Planning, financing, constructing, operating and maintaining buildings and infrastructural facilities have resulted in a growing need for generalists with an interdisciplinary academic background. They must understand the thought processes and language of the many specialists involved in these areas, coordinating their activities and serving as intermediaries. At the Faculty of Civil Engineering, we have successfully trained such well-rounded generalists in our Management [Construction Real Estate Infrastructure] degree programme for more than ten years. Our graduates possess a select combination of skills from the areas of Architecture, Engineering and Economics, along with relevant legal expertise. We offer an attractive, well-balanced curriculum of interdisciplinary and cross-faculty courses, supplemented with an appropriate amount of practical work thanks to our contacts with well-known companies.

For more information, please visit: **www.uni-weimar.de/civilengineering**.

What does the programme offer?

In the six-semester bachelor's degree programme in Management [Construction Real Estate Infrastructure] our students learn to think and act in an interconnected, system-oriented and entrepreneurial manner.

To achieve this, they complete successive courses to learn:
_ Basic knowledge of Mathematics and Computer Science
_ Fundamentals of the basic disciplines, e.g. Economics, Business Administration, Geodesy, Soil Mechanics, Supporting Structures, Building Materials Science, Building Theory, Construction Management and Infrastructure, Law
_ Advanced knowledge of the basic disciplines, e.g. Accounting, Financing, Investment Planning, Marketing, Real Estate and Infrastructure Economics, Foundation Engineering, Building Services Engineering, Building Climate Control, Construction Methods as well as Building, Environmental, Procurement, Contract and Real Estate Law
_ Interdisciplinary fundamentals in Project Development, Real Estate Evaluation, as well as Project, Quality, Ethics, Risk and Strategic Management.

Furthermore, we strongly focus on building soft skills at the beginning of the degree programme with courses in rhetoric, presentation and negotiation. This helps strengthen our students' social competence, communication skills and capacity to assume management-level responsibilities.

The project study component of the programme allows students to independently gain key qualifications, e.g. in scientific working methods, presentation techniques and team work. It also enables them to gain practice-related, holistic and interdisciplinary understanding of buildings and structures in their life cycle.

Before they can begin their bachelor's thesis, students are required to complete a twelve-week internship at a construction-, real estate- or infrastructure-related business. The internship can be completed at one or more firms. The internship requirement is met if the student has already completed a professional training programme in the construction trade, real estate or infrastructure sector, in finance or legal counselling. We strongly recommend that students complete at least four weeks of their internship before commencing their studies.

The bachelor's thesis, which can be integrated in the current research projects at the Faculty of Civil Engineering and is intensively supervised by a faculty member, demonstrates the student's ability to work in scientific manner.

How do I apply?

If you are interested in construction, business administration and management, and if you possess a basic understanding of technology and have attained your university entrance qualification, then you meet the general criteria for admission to our degree programme. Futhermore, we have developed an online assessment test to make your decision easier. There are no admission restrictions. Students may only begin the bachelor's degree programme in Management [Construction Real Estate Infrastructure] in the winter semester. For current information on application and enrolment deadlines and the possibility of applying online, please visit: **www.uni-weimar.de/online-application**. If you have any other questions, please contact our faculty advisors at: **fsb.management@bauing.uni-weimar.de**.

And after my studies?

After completing this programme, you will be qualified to work internationally in a variety of areas, including public service and financial firms in mid-level administrative and supervisory positions and lower echelon management positions.

You will be able to carry out a variety of tasks, such as:
_ Developing, executing and monitoring publicly or privately funded projects in the areas of real estate and infrastructure
_ Analysing profitability of construction, real estate and infrastructural projects
_ Management tasks in the construction, real estate and infrastructural branches: market analyses, strategy and business development, project/business controlling, risk and quality management, construction site logistics
_ Technical, infrastructural and business administrative facility management tasks
_ Structuring insurance solutions and other services in the insurance branch

After successfully completing your bachelor's degree, you are eligible for admission to the four-semester master's degree programme Management [Construction Real Estate Infrastructure] at the Bauhaus-Universität Weimar.

MASTER'S DEGREE PROGRAMME MANAGEMENT [CONSTRUCTION REAL ESTATE INFRASTRUCTURE] (M. SC.)

By combining excellent professional specialisation in construction, real estate and infrastructure with a practice-oriented, interdisciplinary and project-based curriculum, our master's degree graduates can look forward to a wide array of professional opportunities. Thanks to the modular structure of our programme, students can form their own concentrations during their programme, and thereby obtain professional specialisation. They are familiar with the latest developments in their field through the close interweave of research and instruction, and can even participate in current research projects. The integrated period of foreign study and various English-language lectures guarantee an international academic quality.

For more information, please visit: **www.uni-weimar.de/civilengineering**.

What does the programme offer?

This master's degree programme builds on the material taught in the preceding undergraduate programme. Students are expected to learn the established methodological techniques, with which they can develop problem-solving competence, analyse trends and solve current problems. During this four-semester programme, students are taught advanced interdisciplinary fundamentals with courses in project financing, profitability analyses, public-sector procurement management, sustainability analysis and management, facility management, risk management, urban redevelopment, system technology and simulation, along

with lectures, practical sessions and independent project work dealing with legal issues and contractual agreements. Due to the modular structure of the courses, students are able to focus on a specific area of personal interest.

This master's degree programme offers a number of modules with which students can form their own concentrations, *e.g.*:

»Construction Management«
_ Accounting in the construction industry
_ Monitoring and controlling in the construction industry
_ Building cost calculations and controlling
_ Construction in built environment
_ Production technology, logistics

»Real Estate Management«
_ Real estate economics
_ Real estate investment products
_ Strategic facility management
_ Corporate and Public Real Estate Management (CREM/PREM)
_ Basic tax law for the real estate sector
_ Advanced Building Services Engineering

»Infrastructure Management«
_ Traffic planning
_ Urban infrastructure management
_ Demographics and urban development
_ Residential water management
_ Maintenance management of civil engineering structures
_ Dimensioning and networking modes of transport
_ Renewable energies
_ Strategic infrastructure management

By choosing certain modules, the students themselves are allowed to specialise their expertise within their concentration. Several courses are taught in English and contain academic requirements which must be completed in a foreign-

speaking country. Our close contact with international partner universities and the possibility to hold video and Internet conferences with them ensure the strong international orientation of this master's degree programme.

Under supervision by one of our faculty members, students are required to complete a master's thesis during the fourth semester to demonstrate their ability to work in a qualified, scientific manner.

How do I apply?

If you have obtained your bachelor's degree and would like to gain more in-depth knowledge of Management [Construction Real Estate Infrastructure], we invite you to apply for admission to our master's degree programme.

To be eligible for this bilingual degree programme (German and English), you must have obtained a Bachelor of Science (B. Sc.) in Management [Construction Real Estate Infrastructure] or comparable first-level professional qualification deemed equivalent by the responsible examination committee, or a degree from

a public or state-recognised university of cooperative education. You should also possess good German and English language skills and be interested in subject-relevant, technical-economic relationships. Students may begin the master's degree programme Management [Construction Real Estate Infrastructure] in either the summer or winter semester. For current information on application and enrolment deadlines and the possibility of applying online, please visit: **www.uni-weimar.de/online-application**. If you have any other questions, please contact our faculty advisors at: **fsb.management@bauing.uni-weimar.de**.

And after my studies?

After completing this degree programme, you will have no difficulty carrying out supervisory tasks at the mid-management level. Furthermore, you will possess outstanding potential for rapid advancement to higher management positions.

You can expect excellent career and employment opportunities in the following areas:

_ Planning, engineering and architect's offices
_ Construction companies which offer traditional services (planning and building) and those specialised in new business fields (providing system/complete solutions for the entire life cycle of buildings and structures)
_ Project managers, project developers, building contractors
_ Real estate market, infrastructure-related companies
_ Financial consultants, leasing companies, portfolio managers, institutional investors, banks, insurance companies
_ Private developers (in the industrial, commercial and service sectors) as beneficiaries and investors
_ Infrastructure companies (transportation companies, airports, utilities)
_ Public agencies
_ R&D institutes

Students who attain an above-average final grade in this master's degree programme are eligible to pursue a doctorate or gain admission to a Ph. D. programme.

NATURAL HAZARDS AND RISKS IN STRUCTURAL ENGINEERING

»Natural hazards are an integral component of our globalised world – a world influenced to an increasing degree by climatic changes. Based on recent events and field research from around the world, we teach our students scientific-technical fundamentals, create impact simulations and structural models, and demonstrate how scenarios can be played out using modern instrumental tools and advanced geotechnologies. In closely supervised projects, we prepare you scientifically and practically to meet engineering demands at a global and regional level and offer you multifaceted and exciting professional opportunities«
(Dr.-Ing. Jochen Schwarz, Head of the degree programme)

The damage that often occurs to buildings due to natural catastrophes such as earthquakes or storm floods also require examination by engineering-science, in order to better prepare them for future events.

Do you also think globally and want to be active in an international program that focuses on the natural hazards of earthquake, flood or storm?

Do you want to learn about the specific challenges in different countries and regions through course-related projects with a strong orientation towards research and practical application? Then come to Weimar!

You can earn a Master's degree in Natural Hazards and Risks in Structural Engineering (duration: 4 semesters) at the Bauhaus-Universität Weimar.

For more information, please visit: **www.uni-weimar.de/nhre**.

MASTER'S DEGREE PROGRAMME NATURAL HAZARDS AND RISKS IN STRUCTURAL ENGINEERING (M.SC.)

The Natural Hazards and Risks in Structural Engineering (NHRE) master's degree programme has a strong international orientation. It trains students to apply themselves to demanding engineering tasks with regard to specific external influences, such as earthquakes. We teach students how to use modern equipment to assess the dangers of natural phenomena, we show them how to create models and simulations, and we prepare them for conducting projects and-risk analyses of their own. In this way, the programme provides students with key qualifications for engineering positions which require innovative, enterprising solutions for dealing with a wide variety of natural dangers, like earthquakes, floods and storms.

What does the programme offer?

The standard period of study for the English-language master's degree programme Natural Hazards and Risks in Structural Engineering is four semesters. It builds on the expertise and methodical competence acquired in an undergraduate degree programme in a basic field of engineering. We help improve your theoretical-scientific skills and provide you qualification in key areas, such as modelling, numerical simulation, stochastics, foundation engineering, risk assessment and disaster management. Students gain deeper insight into the complex causal chain of natural hazards by studying various areas of engineering, as well as engineering-related fields of the natural sciences, social sciences and economics in greater detail. The compulsory elective modules offer lines of development which

systematically prepare students for practice- and research-related tasks at a later time. This degree programme offers you a high degree of academic supervision and focuses on research-oriented and practical subject matter. We provide you with planning, constructive and analytical skills necessary to meet the engineering demands at both the global and regional levels.

We strongly emphasise the practical relevance of what is taught in the classroom and offer explanatory practical sessions, internships and complementary projects. The programme also includes excursions and seminars, coordinated in part by leading research institutes.

We recommend that our students participate in field studies and relevant projects abroad preferably during the semester break or in preparation of the academic graduation.

During the fourth semester, you are required to demonstrate your ability to work in a scientific manner by writing a master's thesis under professorial supervision. After successfully completing and presenting your master's thesis, you will be awarded a »Master of Science« (M.Sc.) degree from the Faculty of Civil Engineering.

How do I apply?

If you have received your bachelor's degree and wish to gain in-depth knowledge in this field of Civil Engineering, we strongly encourage you to apply for admission to our master's degree programme. To be eligible for admission, you must have attained a B.Sc. degree in Civil Engineering or a comparable subject with a final grade of 2.5 or better. The examination committee is responsible for deciding on exceptions and the equivalence of degrees.

You are also required to demonstrate English language proficiency at the C1 GER level, either by submitting:
a) Proof of language mastery as a native speaker of English
b) Proof of English language proficiency at the C1 level, confirmed by an

internationally recognised certificate (TOEFL, Cambridge Certificate in Advanced English, IELTS) or equivalent certificate.

Students may only begin the NHRE master's degree programme in the winter semester. For current information on application and enrolment deadlines and the possibility of applying online, please visit: **www.uni-weimar.de/online-application**. If you have any other questions, please contact our faculty advisors at: **nhre@bauing.uni-weimar.de**.

And after my studies?

Graduates of the NHRE master's degree programme find employment in engineering offices, agencies, project coordinators and companies. As trained engineers, they not only possess general, practical engineering skills, but are also able to conduct field operations, laboratory tests and solve complex engineering problems in Germany and abroad. Our graduates are predestined to manage interdisciplinary projects in especially threatened regions of the world and provide on-site support to local agencies and organisations.

Students who attain an above-average final grade in this master's degree programme are eligible to pursue a doctorate or gain admission to a PhD programme.

ENVIRONMENTAL ENGINEERING

»Energy, transport, water and waste are globally significant issues and will continue to be so in the future. There is a growing demand for well-trained engineers from Germany. Career perspectives are extremely promising as there is an enormous backlog of investment in reconstruction and maintenance of our public infrastructure which will have to increase in the coming decades to ensure the operation of our cities. This degree programme trains engineers who take responsibility for planning and assessment, material flow management and its corresponding process technology in the infrastructure of urban environments.«
(Prof. Dr.-Ing. Jörg Londong, Head of the degree programme)

The extensive problems facing urban environments require innovative and sustainable solutions. Do you also want think and act globally in order to design our technical infrastructure in the fields of water, waste water, transportation, waste and energy in a sustainable and socially compatible manner? Do you wish to minimize or even prevent environmental pollution as we do? Are you interested in participating in strongly practice-oriented projects during your studies which acquaint you with the challenges facing various regions and countries around the world? Then come to Weimar!

You can earn a Master's degree in Environmental Engineering (duration: 4 semesters) at the Bauhaus-Universität Weimar.

For more information, please visit **www.uni-weimar.de/civilengineering**

MASTER'S DEGREE PROGRAMME ENVIRONMENTAL ENGINEERING (M.SC.)

The Environmental Engineering master's degree programme is characterised by a high degree of specialisation combined with the necessary fundamental knowledge, international orientation and methodical expertise based on the latest standards in technology. Our students possess a combination of engineering and natural scientific skills and understand the complex interplay between technology and the environment. They gain the necessary knowledge to make a significant contribution toward solving the problems of our time.

For more information, please visit: **www.uni-weimar.de/civilengineering**

What does the programme offer?

The four-semester master's degree programme in Environmental Engineering builds on the natural scientific and engineering fundamentals taught in the undergraduate programme. The obligatory modules consist of the basic subjects Mathematics/Statistics, Applied Computer Science and Urban Infrastructure Management. Elective modules may include any of the courses offered at the university. The compulsory modules contain subject-specific basic subjects such as Waste, Residential Water Management, Urban Redevelopment, Environmental Geotechnical Engineering/Hazardous Waste/Landfill Construction and Transportation. The elective compulsory modules allow students to specialise in an area of interest. Students can put together elective modules from the entire range of courses offered at the university, e.g. a language module for a period of study abroad, and parts of the elective compulsory modules from the wide range of courses offered by the Faculty of Civil Engineering.

The Environmental Engineering master's degree programme requires all students to complete a period of foreign study. This provides them the chance to complete at least two modules (or 12 credit points) at a university in a foreign-speaking country. We recommend that students gain practical work experience in their professional field during their studies. However, students are not required to complete an internship as part of this master's degree programme.

In the fourth semester, students are required to write a research-related master's thesis, supervised by a faculty member. The purpose of the thesis is to demonstrate one's ability to work in an engineering-scientific manner and discuss one's topic with a focus on one's professional goals if possible.

How do I apply?

Students may begin the Environmental Engineering master's degree programme in either the winter or summer semester. To be eligible for admission, you must have attained a Bachelor of Science (B.Sc.) degree with an above-average final grade in Environmental Engineering or an equivalent subject-related, first-level professional qualification. Graduates with other degrees can be admitted after successfully completing an assessment test or interview. Application is possible through **www.uni-weimar.de/online-application**. If you have any further questions, please contact our faculty advisors at: **fsb.ui@bauing.uni-weimar.de**

And after my studies?

Whether you decide to work in Germany or abroad, an Environmental Engineering master's degree will allow you to enter a variety of exciting professional fields.

Our graduates are typically found in positions of responsibility with regard to planning concepts, assessment, material flow management and its corresponding process engineering at:

_ Engineering and planning offices
_ Technical and regulatory agencies
_ State and municipal administrative authorities
_ Research institutes
_ Service providers in the field of urban development and city management

Students who attain an above-average final grade in this master's degree programme are eligible to pursue a doctorate or gain admission to a PhD programme.

RESEARCH AT THE FACULTY OF CIVIL ENGINEERING

The Faculty of Civil Engineering is internationally renowned for its research activities and outstanding scientific achievements. Its success in procuring external funding for its many research proposals and its affiliation with numerous institutes and research centres is evidence of the faculty's excellent reputation. Its Research Training Group 1462 »Model Qualities«, funded through German Research Foundation (DFG), is the only research training group in Thuringia active in the civil engineering field.

Aside from teaching, the faculty regards its essential task as one of conducting basic and applied research and integrating it into high-quality instruction. This research is chiefly focused on developing new, future-oriented technologies.

Main areas of research

The Faculty of Civil Engineering focuses on three main areas of research:
_ Digital Engineering (Modelling, Simulation and Visualisation), based on constructive civil engineering designs
_ Urban and suburban environmental and infrastructural tasks in a technical engineering and economic context
_ Material engineering with a focus on building materials

This research profile is strongly shaped by four institutes:

Institutes

The F.A. Finger Institute for Building Material Engineering (FIB) is comprised of three chairs and focuses its research on the areas of concrete durability, cement, mortar, concrete, concrete recycling, plaster, polymers and building renovation. Its modern laboratories and experimental testing facilities guarantee the latest teaching and research capabilities and enable us to train our employees to become internationally sought-after experts in the field of concrete research.

With six chairs, its own testing facility and the Earthquake Centre, the Institute of Structural Engineering (IKI) at the Faculty of Civil Engineering investigates decisive new processes and methods for contemporary supporting structures, such as innovative glass-based compounds and new methods in wood and masonry construction.

The scientific work at the Institute of Structural Mechanics (ISM) focuses on the design of new, efficient and robust simulation methods, which can be used to predict the responses of supporting structures under various loads, as well as the development of experimental methods for the dynamic analysis of supporting structures.

The researchers at the Institute of Mathematics/Building Physics (IMP) develop analytical and numerical solutions and experimental analyses of mathematical and building-physical problems in civil engineering. The main areas of research include modelling, simulation and visualisation of the underlying processes and the development of efficient, customised solutions.

The scientific orientation of the Faculty of Civil Engineering is strengthened by two additional research centres.

Research centres

The Earthquake Damage Analysis Centre (EDAC), or Earthquake Centre for short, studies structural damage caused by earthquakes and other natural disasters, and is involved in research, field surveys and international projects and conducts within the master programme »Natural Hazards and Risks in Structural Engineering (NHRSE)« education activities.
More information: **www.uni-weimar.de/Bauing/edac/**

The Centre for Structural Dynamics and Earthquake Engineering bundles the research expertise of the Earth Quake Centre and the chairs of Structural Dynamics and Soil Dynamics. Their interconnection creates a scientific focus in which research and instruction in the area of Structural Dynamics and earthquake engineering can be expanded further on the basis of existing synergies.
More information: **www.uni-weimar.de/csde/**

Research Training Group 1462

The doctoral candidates in the Research Training Group »Assessment of Coupled Numerical Partial Models in Constructive Civil Engineering« examine the question: How closely do simulations reflect reality when modelling structures under extremely dynamic conditions, such as earthquakes or storms? The unique feature of the programme is its comprehensive view of the research subject. In the past, various researchers would provide data on various aspects of buildings, which in combination would often possess an unknown potential for error. In this research training group, all of the research activities and testing are comprehensively referenced from the very beginning.

Its abbreviated name »Model Qualities« refers to its central focus of study, i.e. determining how closely numerical simulation models of buildings of constructive civil engineering reflect real-world conditions. The quality of the prognoses based on a simulation model is especially important for coupled partial models that are used to predict the realistic behaviour of highly complex total systems. Even today, this issue remains largely unresolved in the entire field of civil engineering.

The doctoral candidates conduct scientific work in the main research areas of theoretical fundamentals, material sciences, engineering applications and computer science in construction. Throughout the training period, they also evaluate the theoretical findings on the basis of real-world structures (e.g. TV broadcasting towers or bridges).

The Research Training Group also intensively cooperates with foreign partners and allows the doctoral candidates to spend at least one semester researching at an international partner institution.

For more information, please visit: **www.uni-weimar.de/grk1462**.

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www.uni-weimar.de.

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