



FGG

University of Ljubljana,
Faculty of Civil and Geodetic Engineering

MISSION STATEMENT

To teach, create new knowledge and develop innovative solutions in the areas of civil engineering, environmental engineering and geodesy.

Research work intertwined in international environment, professional excellence and excellent teaching enable us to educate innovative engineers of the future.

In cooperation with the economy and society we solve development and professional issues, develop sustainable construction and co-create conditions for healthy and safe environment.

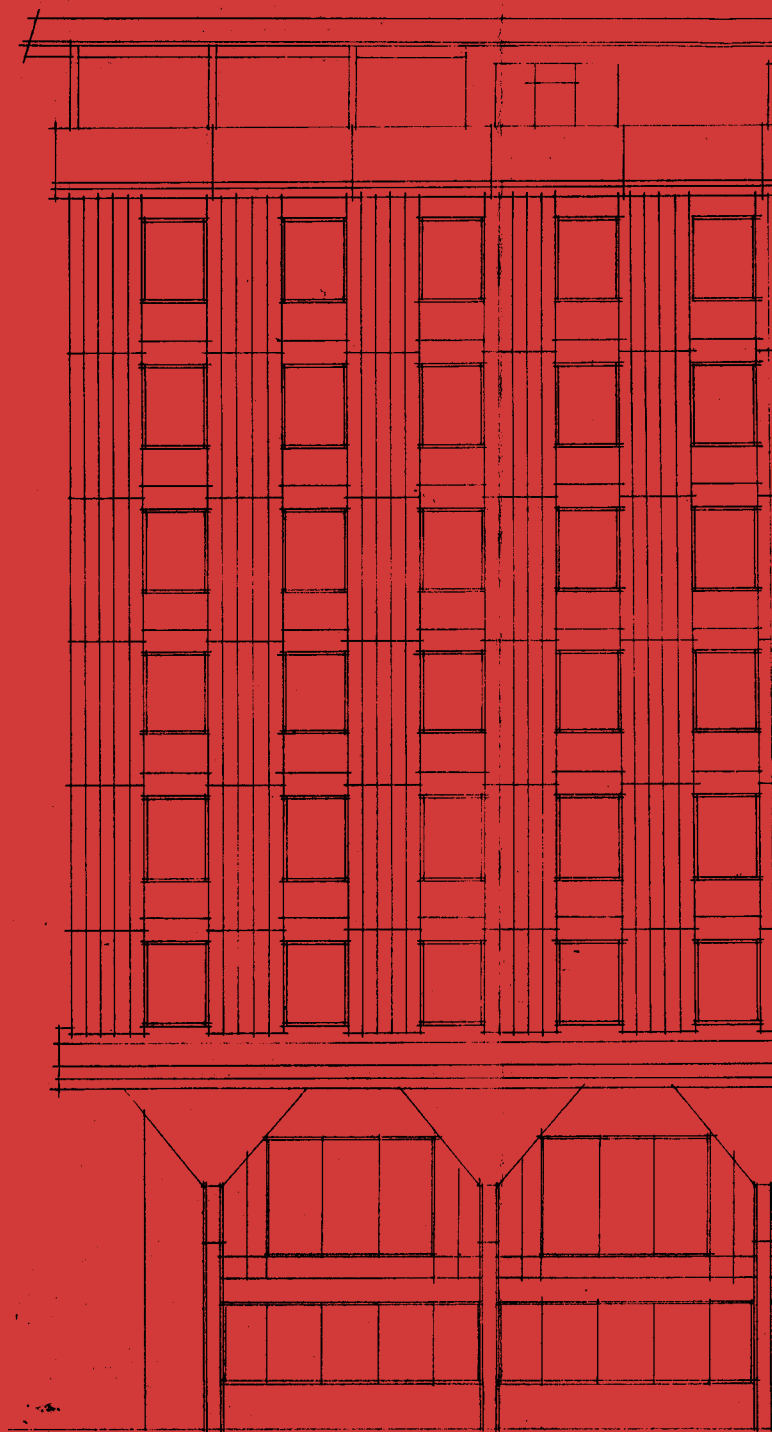


TABLE OF CONTENTS

02	Mission statement
04	About UL FGG - Dean's foreword - Who are we and what do we do? - How are we organised? - How do we care for quality? - Which study programmes do we offer? - How do we provide cooperation? - How do we research? - Our ambassadors
13	Department of Civil Engineering - Foreword - Teaching - R&D and consulting
23	Department of Geodetic Engineering - Foreword - Teaching - R&D and consulting
29	Department of Environmental Civil Engineering - Foreword - Teaching - R&D and consulting
35	About students - Student organizations - Study abroad and foreign students at the UL FGG - Students' social life - Students about us
44	Vision of the UL FGG

DEAN'S FOREWORD



Dean of the UL FGG,
Prof. Dr. Matjaž Mikoš

***“Our students will solve the
challenges of the future.”***

This brochure about the Faculty of Civil and Geodetic Engineering of the University of Ljubljana (UL FGG) should reveal you its inspiring and up-to-date study programmes. Our professional and university degree study programmes are focused on built environment and span across several disciplines, from engineering (civil, geodetic and environmental) to natural and social sciences. Built on tradition, our research and teaching is inter- and multidisciplinary with activities and experiences in Slovenia and abroad - within the European research area and for the European labour market.

Even though we are active in solving professional issues and performing basic as well as applied research, our main mission is teaching; and we are focused on students' needs - also those coming to our faculty as exchange students. We prepare students for work environment that is changing fast due to all-embracing globalisation and new challenges, such as climate change, emerging technologies and new materials, as well as fast post-industrial social development. Our graduates are capable of facing new tasks and developing new knowledge, not only applying knowledge gained during studies.

We hope that this brochure will convince you to join us for a semester or more. Take a look at the short summary of UL FGG and listen to the voices of our students, what they have to say about us.

WHO ARE WE AND WHAT DO WE DO?

Slovenian higher education has its origins back to the time of Illyrian Provinces in the years 1809 – 1813. At that time it included, among others, school for engineers – architects. The Slovenian geodetic profession started its development a few years later, in 1817, with the beginning of large surveying works for the needs of land cadastre. In 1919 the University of the Kingdom of Slovenians, Croats and Serbs was established in Ljubljana. It included also technical faculties and was direct predecessor of the today's University of Ljubljana.

Today, the University of Ljubljana consists of 3 academies and 23 faculties that offer more than 300 different bachelor, master and doctoral study programmes to more than 40,000 students, which places it among the largest universities in Europe. With their research and scientific projects the researchers of the University of Ljubljana keep pace with the latest developments in the areas of arts, sciences and technology at home and abroad. Currently, the University ranks among 500 best

universities in the world according to Academic Ranking of World Universities (ARWU – “Shanghai ladder”) and top 4% of European universities.

At first, the Department of Civil Engineering and the Department of Geodesy were active within the Technical Faculty of the University of Ljubljana, boasting with numerous esteemed professionals. At present, the Faculty of Civil and Geodetic Engineering (UL FGG) is represented by these two departments and also the Department of Environmental Civil Engineering. Worth mentioning are also our study programmes Buildings and Spatial Planning. The Faculty has over 1000 students studying in 5 undergraduate, 5 graduate and 1 doctoral programmes. The Faculty employs close to 200 full-time employees, over 90 of them are academic staff. The number of employees at the UL FGG with PhD is already above 70. At the same time, the number of high quality publications of its researchers in scientific journals is growing as well.



HOW ARE WE ORGANISED?

The Faculty implements its basic teaching, research and professional activities within three departments, two laboratories for experimental research, education and scientific work, and three research institutes for the areas of structures, earthquake engineering, computer science, water management and geo- and hydro threats.

ORGANISATIONAL STRUCTURE OF UL FGG

■ Research Institutes

- Institute of Structural Engineering, Earthquake Engineering and Construction IT
- Water Management Institute
- Research Institute for Geo and Hydro Threats

■ Laboratories

- Structural and Traffic Laboratory
- Hydraulics Laboratory

Secretariat (Dean's Office)

- Personnel Department
- Office of Student Affairs
- Financial and Accounting Services
- Research Services
- International Relations Services
- Economic Affairs Services
- Information Centre
 - Library
 - IT Support Services
 - Promotion and Career Centre of UL FGG

We work in two buildings, and are very proud of them, because they are both part of the Slovenian cultural heritage. The main building of the UL FGG is located at Jamova 2 and was designed by architect Ravnikar, one of the most prominent architects of the Slovenian modern stream.

■ Departments

▫ Department of Civil Engineering

- Municipal Economics Institute
- Chair of Construction IT
- Chair of Structural and Earthquake Engineering
- Chair of Concrete, Masonry and Timber Structures
- Chair of Mathematics and Physics
- Chair of Mechanics
- Chair of Soil Mechanics with Laboratory
- Chair for Metal Structures
- Chair of Construction Management
- Chair of Testing in Materials and Structures
- Chair of Buildings and Constructional Complexes
- Traffic Technical Institute

▫ Department of Geodetic Engineering

- Chair of Geodetic Surveying
- Chair of Geoinformation and Real Estate Cadastres
- Chair of Surveying Engineering
- Chair of Cartography, Photogrammetry and Remote Sensing
- Chair of Mathematical and Physical Geodesy and Navigation
- Chair of Spatial Planning

▫ Department of Environmental Civil Engineering

- Chair of Hydrology and Hydraulic Engineering
- Chair of Fluid Mechanics with Laboratory
- Institute of Sanitary Engineering

HOW DO WE CARE FOR QUALITY?

Care for quality is one of our main guidelines in all areas of our work, as we are pursuing the goal to be listed among the best faculties in Central Europe for all research and study areas of the UL FGG. Administrative and technical support to teaching, research and professional work is provided by our Computer Centre, Office of Student Affairs, Library, Promotion and Career Centre, Secretary's Office and Financial Accounting Service.

With the support of all employees we strive to keep raising the quality of our work, reputation and recognition of our Faculty in Slovenia and internationally. We monitor quality in different ways, including, among others, by subjecting our institution and study programmes to national (NAKVIS) and international

(ASIIN) evaluations and accreditations. We also care a great deal how all our employees and students feel at the UL FGG. Therefore, we conduct student surveys, asking students for their feed-back. For some years now we have been implementing the tutoring system, including introductory tutors for the first year students and international students, course-specific tutors as well as teachers mentoring individual classes or even individual students. The mentoring system is especially important for the students with special needs. We are building a common UL FGG student community also with extra-curricular activities. Some are intended to fun and enjoyment (trips, camps), while others serve to give students new knowledge, competences and widening of their social network, which is often a great advantage when they search for their first job.

FACULTY OF CIVIL AND GEODETIC ENGINEERING IN NUMBERS (2014)

Number of employees	■■■■	195
Of that teaching staff	■■■■	87
Number of students	■■■■	1,238
Number of full-time students (bachelor)	■■■■	798
Number of master students	■■■■	264
Number of doctoral students	■■■■	99
Number of part-time students	■■■■	77
Total surface of buildings owned by UL FGG	■■■■	11,406 m ²
Surface intended to teaching activities	■■■■	4,078 m ²
Annual budget	■■■■	10,514,341.62 €

WHICH STUDY PROGRAMMES DO WE OFFER?

Study programmes from the areas of civil engineering, environmental engineering, geodesy and geoinformation, spatial planning, buildings and management are excellent guarantee to the new generations of students to spend one's career engaged in interesting work, cooperating with important people and in inspiring projects. Despite economic crisis, which has hit in Slovenia especially the construction sector, these occupations are still in high demand and offer good chances of employment, either in Slovenia or abroad.



STUDY PROGRAMMES

■ 1st cycle

- ▣ Higher education professional studies
 - Construction Management
 - Technical Real Estate Management
- ▣ Academic study programs
 - Civil Engineering
 - Geodesy and Geoinformation
 - Water Science and Environmental Engineering

■ 2nd cycle

- ▣ Master study programmes
 - Civil Engineering
 - Geodesy and Geoinformation
 - Water Science and Environmental Engineering
 - Buildings
 - Spatial Planning
 - Geophysics (with Faculty of Mathematics and Physics and Faculty of Natural Sciences and Engineering)

■ 3rd cycle

- ▣ Doctoral study programmes
 - Built Environmental
 - Environmental Protection (with 12 other members of UL)

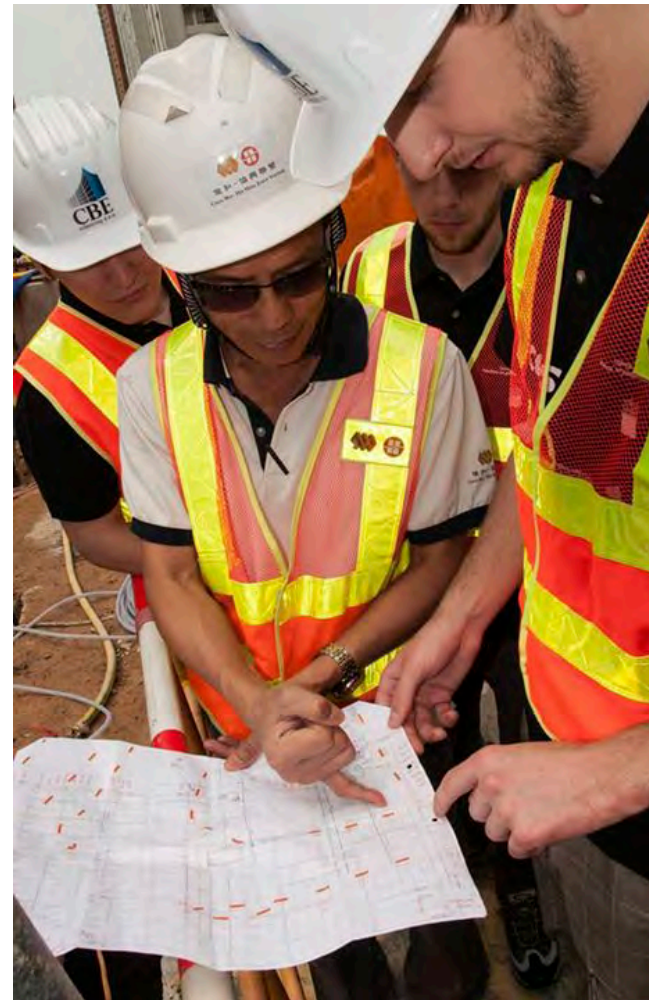
Students of the 1st and 2nd cycle studies may select electives in the scope of 5 to 10 ECTS also from other national, as well as international higher education institutions, which has also become a standard practice. Also students from other members of the University of Ljubljana and other higher education institutions can select elective courses offered at the UL FGG. Indeed, 3 courses are accredited especially for students of other, non-engineering faculties. Our teachers frequently participate in many study programmes of other members of the University of Ljubljana, as well as at other higher education institutions in Slovenia and abroad.

We put a lot of effort into increasing our international activity, realised in the form of exchange of students, teachers and researchers (incoming and outgoing). Through our International Office the Faculty provides systematic support to incoming and outgoing students and teachers within the Erasmus+ programme as well as other programmes, such as CEEPUS, Basileus and others. The number of bilateral agreements is constantly growing, with currently more than 40 signed with institutions around Europe, and offering the capacity of around 60 exchange students per year in both directions.

The international cooperation beyond the European borders is also gaining steam with the involvement in programmes such as LOTUS, Erasmus Mundus, Marie Curie, etc. Thus, within a second cycle master programme Erasmus Mundus in Flood Risk Management, each year we host students from all around the world, in an integrated programme leading to multiple diplomas. Its associated members are Unesco-IHE (the Netherlands), Technical University of Dresden (Germany), Technical University of Catalonia (Spain) and the University of Ljubljana (Faculty of Civil and Geodetic Engineering).

HOW DO WE PROVIDE COOPERATION?

Once our students finish their studies, they can find job in private as well as public sector, where they normally build successful careers. At the UL FGG we make sure that even after graduation we stay in touch through our Alumni Club, since many of our graduates are now successfully pursuing their careers abroad.



HOW DO WE RESEARCH?

Research activity is another important part of the UL FGG activities. The UL FGG encourages research work of its employees, since it is an essential condition for preserving long-term excellence of our study programmes with continuous transfer of knowledge and the latest research results into our curricula.

Our researchers publish their achievements in some most prominent international scientific journals and conferences. Especially worth mentioning is our own digital repository (DRUGG), which is a rich source of diploma, master and PhD theses as well as scientific papers published by our researchers at national and international conferences and in scientific and professional journals.

The research work involves many different fields of science and is described into more detail in the sequel within the presentation of individual departments.



OUR AMBASSADORS

Graduates of the UL FGG are the best possible ambassadors of our Faculty. With their knowledge and competences they actively contribute to the development of economy and society as a whole and thus co-create the future.

Janja Avbelj

I studied geodesy at the UL FGG and finished my studies with a diploma thesis from the area of photogrammetry that I prepared at the Technical University in Munich. The study and the exchange in Munich were my entry point to the research sphere. At the moment I work as researcher in the area of remote sensing and digital image processing at the German Space Agency (DLR). Beside the research work that I do, I am also engaged in a project for the acquisition of stereo images as operator in airplanes and I prepare processes for the analysis of data and video camera images which will be, according to plans, installed in 2017 in the International Space Station.



Jure Klopčič

I work as leading engineer in the construction of manufacturing tunnels in a uranium mine Cigar Lake in Northern Canada, one of the technically most demanding and technologically most supported mines in the world. With the help of excellent and extremely wide theoretical knowledge from the UL FGG as well as experiences in tunnel construction at the Slovenian motorway cross, I contributed as member of a team of international experts a great deal to the resumption of uranium production in the mine after 26 years of constant problems and high financial investments.



Nina Delakorda

As graduate from the academic study programme Civil Engineering at the UL FGG I was very well accepted in an Austrian company where I work as supervisor. My job involves mainly supervision of works at construction sites and making sure that works run according to design projects. In two and a half years of my work abroad I have come to the conclusion that our faculty actually gave me a lot. One can quickly learn a language, but the knowledge acquired in four years of study is what really counts and makes a difference among engineers.

Nataša Atanasova

For me, like for many others, the choice of study was far from easy. An important factor was engineering and interdisciplinarity, and the study at the UL FGG promised exactly that: good technical basis as well as 'width' for a profound insight into the issues of environment in relation to human activities, such as: pollution, water supply, flood safety. The knowledge I acquired was a sound basis for further studies and my career at home as well as at foreign universities: Danish Royal School for Pharmacy, Danish Technical University, University in Adelaide (Australia), University in Algarve (Portugal). For the moment I am working on how to introduce sustainable use of natural resources (water, energy and food) in cities, at the University of Girona (Spain).



Jernej Herzog

Internationally recognised diploma of the Faculty of Civil and Geodetic Engineering and first class applicable education that I acquired from the study programme Water Management and Municipal Engineering helped me significantly in my search for a job that I found in the United Arab Emirates. I work in an international company as product manager for the area of waste water treatment, waste mud treatment and protection against smell at purifying plants for waste and drinking water. The ability of integral solving of problems and profound professional knowledge that I acquired during my studies are extremely valued by employers in this country, in high demand and they enable my fast advancement on the corporate ladder.





**DEPARTMENT
OF CIVIL
ENGINEERING**

FOREWORD



Head of Department of
Civil Engineering,
Assoc. Prof. Dr. Janko Logar

*“It is only together that we can build
our future.”*

Although construction has been human activity for several millennia, it remains an attractive field of engineering, as it involves creativity and innovations. Compared to other engineering disciplines, where serial production is often used, civil engineering structures are always unique, built for different purposes in different environmental conditions and thus exposed to different actions, having unique architectural design. Civil engineers have to be creative and devoted, there is no room for mistakes. Sound understanding of fundamental engineering theory is just as important as knowledge and awareness about materials and technologies. In civil engineering, the final product is always an accomplishment of coordinated effort of interdisciplinary group of professionals. In such a group not only science but also soft skills become important.

Research and education of future civil engineers is a privilege for the staff of our department organized in 12 teaching and research units. This makes us the largest department at the Faculty. Our research and teaching areas include mathematics and physics as a basis of engineering sciences, mechanics, building materials, structural and earthquake engineering, efficient use of energy and living comfort, municipal, geotechnical and traffic engineering, management of civil engineering works and – with least tradition but with high potential – information and communication technology, which has changed in the last 50 years the very traditional construction sector and enabled new options of design, communication, documentation and execution of civil engineering works and quality control.

Civil Engineering department is well connected with national economy and international research community. Our greatest pride, however, are our graduates with whom we share our knowledge and enthusiasm for creativity, curiosity that leads us forward, and awareness that only together we can build the future.

TEACHING

Studying Civil Engineering requires solid knowledge of mathematics and physics, two fundamental fields required for the understanding of natural phenomena. Acquiring knowledge through these two courses enables the student to develop the language for the formulation of engineering problems, and, at the same time, provides basic tools for their solutions. On the other side, contemporary civil engineering exploits possibilities available through the modern information technology. As a consequence, we offer, on all levels, courses that empower the student to use the computer-aided design and information technology throughout the service life of the structures.

The use of information and communication technology crucially contributes to the digital transformation of the construction industry and to new ways of design, execution and management of structures. Within this context, implementation of Building Information Modelling, web communication, engineering data

infrastructure and associated work methods, cooperation and organisation can be encountered. All teaching activities are computer-aided; students can find most of the study materials on the web classroom, while within professional courses, they learn how to use with specialized software tools used in practice.

Recently, interdisciplinary project-oriented study, supported by the state-of-the-art IT tools, was implemented in our computer classrooms. Within this project, students design structures in close collaboration with the students of architecture. This innovative approach received the reward from the Faculty of Education of the University of Ljubljana. Increasingly the teachers use elements of project-oriented study, where students independently solve practical problems that are often linked to the collaborating enterprises. A recent example is the endeavour carried out by a group of M.Sc. students that deals with the loadbearing structure of a 40 m-high wooden tower.



Traditionally, the first years of Civil Engineering Studies are focused on acquiring the fundamental knowledge from the fields of structural engineering, strength of materials, hydromechanics, soil mechanics, and basic professional courses like Construction Materials, Geodesy, Roads, Construction Technology, Architectural Engineering.... At the end of the program, students gain in-depth knowledge of individual civil engineering areas by choosing one of the modules: structural, municipal, traffic, geotechnical or hydrotechnical engineering, construction management or building design. The emphasis of the structural engineering is placed on the safety of structures for all structural materials. Students learn the rules of appropriate conceptual design of buildings and engineering structures, methods for static and dynamic structural analysis, as well as procedures for the design and construction of wooden, steel and reinforced concrete structures. Special emphasis is placed on the earthquake resistance. Students taking the Municipal Engineering Module gain in-depth knowledge in the field of spatial planning, real estate management, in particular communal and residential infrastructure management, and real estate valuation. The goal of the courses offered within Traffic Engineering Module is to understand the properties and rules of the road and railway traffic, provide knowledge related to planning, design, construction and maintenance of road traffic and railway engineering, and to be able to predict and model traffic flows. The graduate of the Buildings Module is a specialist for the field of building physics, efficient use of energy in buildings and living comfort assurance. Last but not least, in order to respond to the needs of contemporary society, special emphasis is placed on the maintenance and refurbishment of existing structures.

An important part of the teaching activities is laboratory work. In structural-traffic laboratory students learn about structural materials, their properties and appropriate testing methods. The programme takes partly place in soil mechanics and fluid mechanics laboratories.





Where appropriate, teachers use field work as a study method, while others organize field trips with specific study goals, where current construction sites with different structures can be seen, along with production units for construction products and prefabricated elements made of concrete, wood or metal. Students also learn how waste materials can be used as secondary raw materials, or be disposed permanently in an environmentally friendly manner.

Special attention is focused also on the study materials. Our courses are supported by study materials available in electronic form in the web-classroom, while for the vast majority of fundamental courses, textbooks are offered as well.

Since 1995, the Faculty is organising national competition in structural mechanics for high school students. The aim of the competition is to create the awareness of the field of mechanics, while students gain in-depth knowledge in this particular field. As a response to extremely positive feedback from the participants and their teachers, each year our teachers prepare a collection of field-related problems along with their solutions. Further on, we also encourage our students to participate in competitions outside the Faculty.

We are proud of our graduates, who show in their final theses the ability of independent study and synthesis of acquired knowledge on case studies of research or professional character. The Faculty also awards the Faculty prizes to the best students during studies, while the best final theses are awarded the prestigious Prešeren prize.

R&D AND CONSULTING

R&D and consulting at the Department are carried out through our Research Units, who merge their efforts among themselves as well as with external national and international partners. We have a well developed collaboration with many established institutes and universities from other countries, e.g. Danish Technical University, Tokyo University, Karlsruhe Institute of Technology, ENS Cachan, Stanford University, UC Berkeley, European Laboratory for Structural Assessment in Ispra, VTT (Finland), ITMW (Germany), Technical University Prague, Graz and Vienna, as well as several universities in the Western Balkans. We are successful in competing for the EU projects, and we have a well established collaboration with the construction industry in Slovenia and abroad. We take part in the development of new standards and other technical legislation in the civil engineering field, and in the transfer of European standards to Slovenia. We are frequently engaged as reviewers of projects where demanding structures are planned. A part of our professional activity is also construction forensics, where we take part in the determination of causes of conflicts and/or consequent mediations among construction project stakeholders.

Research within the department is conducted through 5 research programmes: E-Civil Engineering, Building Structures and Building Physics, Structural Mechanics, Earthquake Engineering, and Water Science and Geotechnics. In particular, the research achievements of earthquake engineering, mechanics and construction IT are recognized on international level.

In the field of construction materials and testing of structures, our researchers conduct experimentally supported analyses of cultural heritage buildings and innovative structural elements, such as, laminated wood frames with glass panels, or panels made of waste packaging material. Research activities are focused on both protection of built heritage as well as on innovative solutions for contemporary

buildings. For mineral materials (brick, concrete, mortar and injection grouts) we carry out, in cooperation with other laboratories within the University, analyses of chemical composition and microstructure. Significant research efforts are also targeted to the contemporary technologies of materials with mineral binders (cement, lime, supplementary cementing materials). We develop new types of concrete with enhanced durability or strength. Due to the importance of rheology of mineral binders in fresh mixtures, research is conducted in this field as well. We carry out laboratory testing of concrete and pre-stressed concrete structures, metals and various strengthened composite wood elements. Development of innovative reinforced and pre-stressed concrete, composite and wooden structural elements and pre-fabricated systems is performed in collaboration with industrial partners. In order to identify damages of structural elements, the destructive laboratory tests are supplemented with non-destructive testing.



Significant amount of our research energy is focused on fundamental and applied research, as well as development of methods and tools for realistic modelling of complex structural elements and structures subjected to various loads, including fire and earthquake. The developed methods and tools enable the execution of nonlinear analysis of composite beams, wooden beams, glue-lam timber structures, steel, reinforced concrete and composite structures subjected to high temperatures, polymer structures, non-linear dynamics of spatial structures and statistical methods and reliability of structures. Fundamental research has always been the starting point for further applied studies that lead to socially relevant achievements: our research achievements in the field of earthquake engineering have significantly contributed to the enhanced earthquake safety of many important structures, for example nuclear powerplants, important bridges and shopping centres. Social relevance is exhibited also by the research conducted in the field of commonly used structures, such as residential and industrial buildings. Collaboration with various companies leads to many new and enhanced design procedures for different types of structures, e.g. reinforced concrete wall buildings, prefabricated buildings and bridges.



Significant attention is devoted to the development and application of novel technologies (e.g. earthquake isolation) and new environmentally friendly materials (e.g. high performance synthetic materials) to be used for the improvement of earthquake safety of different structures. Researchers working in the field of earthquake engineering and steel structures are extremely active in work groups of the European Committee for Standardisation. Involvement in the work of this organisation is also a source of new ideas for further research and ensures their relevance and actuality.

We are proud of the research achievement in the field of Scientific Computing, where the knowledge from the field of computer science, mathematics and mechanics is accumulated and combined with the understanding of the technologies. In the past two decades, an innovative system for automatic creation of non-linear numerical models has been developed by our researchers. It consists of two software tools: AceGen that enables automatic generation of numerical programs, and AceFem that provides symbolic numerical environment for the use of Finite Element Analysis. These programs are supported by leading world producer of general symbolic environments for technical computing Wolfram Research, Inc.. The system has received recognition of several research groups working in the field of engineering modelling.

We are also developing design methodologies for the design of buildings, their elements and structural parts from the viewpoint of bioclimatic conditions, and we carry out stationary and dynamic analyses of heat flows in buildings and analyses of illumination and insulation. Further on, we develop control systems for the regulation and optimisation of internal environment in buildings. Thermal comfort of the users is one of our primary interests. Therefore, we develop computer simulations for the analysis of thermal and lighting properties of buildings, and we investigate user-building interactions, with the emphasis on healthy and stimulating environment. Within this area, experiments in real living environment are conducted, with the purpose

of verifying simulation assumptions and demonstrating the efficiency of advanced systems for internal environment regulation.

In the field of geotechnical engineering, the development of knowledge and methods for soil investigation is tightly linked to the needs of the industry. During the Slovenian highway construction period, several new field and laboratory procedures and equipment, e.g. pressiometer, flat and seismic dilatometer, cyclic shear test, suction measurements and measurements of non-saturated soil behaviour, were introduced into the Slovenian practice. Our research work consists of numerical analyses, use of new materials in geotechnics (e.g. geosynthetics), implementation of new technologies, such as continuous compaction control, improvements of pre-stressed ground anchors, and automation of interpretation of displacement monitoring data in tunnels. We are increasingly active in the field of environmental geotechnics in providing solutions for ecologically and technically suitable use of by-products of chemical and metallurgical industry as secondary raw materials or safe permanent disposal of such materials. In addition to the field investigation, significant amount of research work is carried out in our well-equipped laboratories.

Research in the field of traffic engineering aims at contributing to the quality improvement of roads and railways in all stages of their life cycle – from planning and design, to construction, operation, maintenance and refurbishment. In our work, we use multi-criteria decision methods with the purpose of achieving more rational procedures, as well as to ensure more efficient use of available financial means. Similar methods are being developed also for the field of cultural heritage buildings. Fundamental research carried out in the field of macroscopic and microscopic transport models aims at improving predictions of traffic development that are required as the baseline for road planning and design. Studies of drivers' response to geometrical elements of roads and environment aim at contributing to the design of safer roads. One of the focuses of our research work is also





intelligent transport systems that can increase the safety and efficiency of the infrastructure. In cooperation with our partners we have developed several IT solutions aimed at improving efficient project management of projects, processes and databases that are regularly updated.

The success of a construction project is crucially dependent upon optimisation and planning of all processes that take place in construction. All stages of construction, from the identification of clients' needs to the onset of use of the structure, need to be encompassed. We use and develop up-to-date methods and techniques of planning, monitoring and analysis of projects with the purpose of achieving their implementation in contemporary engineering practice. By using multi-decision methods we identify priority tasks in the field of construction, operation and management of different structures. In the field of information support provided to the construction project management, we link our activities with industrial partners who develop appropriate software. We emphasize comprehensive approach to the management of the built environment, which is why special attention is placed on the operation and maintenance of structures. We are aware of the importance of the environment protection. Thus, research activities are carried out also in the field of environmental management in the construction industry. Within this area, we monitor current state in the construction industry and seek solutions for their environmental problems. Life Cycle Analysis is used when appropriate.

»What is essential is invisible to the eye!« could be said for the communal infrastructure. Buried underground or installed on the surface, it seems to be self-evident from the viewpoint of its existence as well as operation. We realize that it exists only when its operation is interrupted. The results of our research show that this is, to a large extent, the consequence of disinvestment and inadequately calculated depreciation rate in the field of communal infrastructure. It is a fact that realization of the sustainable development paradigm applied to the cities cannot be carried out without continuous development of the communal infrastructure.

As a consequence, an important research question regarding the economic justification and accessibility of new investments into communal infrastructure is posed to us in relation to the spreading of cities to the countryside. Further on, we investigate the ability of the public sector to mobilise construction land plots that are a necessary condition for the realization of investment projects. Since 1991 we have collaborated in the development of real estate market valuation system in Slovenia. Together with partners, we also provided the fundamentals for the models of mass valuation of real estate in Slovenia.

The use of modern information and communication technologies (ICT) in construction has a pivotal role in the digital transformation of construction industry and improvement of design, construction and facility management. We employ methods of information modelling (BIM), internet communication, and high through-put communication networks. We develop advanced applications of Building Information Modelling (BIM) in pre-construction, construction and post-construction stage. In our work, we link modelling of function and technological solutions of building elements and systems. We emphasize the importance of information protocols for all key construction project stakeholders at different levels of BIM development. The research work is focused on automation, mobility, quantitative and qualitative analysis of advanced data capturing techniques, including point-cloud data, and relevant analysis.

We also advance and develop modelling techniques for project management (5D), develop models from the concept to the direct use of models for production in scale (3D printing) and develop methodology for project realization in real-scale, for the control of construction, actualisation of models with sensors, augmented reality, and, last but not least, model maintenance of structures (6D). Our research work also covers software and systems engineering that will be significantly changed in the next few years. Therefore, we actively transfer our expertise to the construction industry (e.g. development of demanding Cloud applications for the computation of dynamics of solid structures or liquids).

All activities listed above could not exist without the universal language of engineering – mathematics – and the fundamental natural science knowledge from the area of physics. Our mathematicians collaborate in research projects where various analytical, statistical and numerical methods are used, such as traffic flow modelling or modelling of functional regions. The contribution of physicists in the field of building physics, the development of non-destructive testing methods of concrete elements and the application of phase-change materials in thermal protection of buildings is indispensable. Nevertheless, our mathematicians and physicists conduct the majority of their research activities in their own field, such as numerical mathematics, theory of chaos, theory of operators, development of batteries with enhanced properties, and even in the areas such as research of magnetic properties of new materials with potential application in medicine.



**DEPARTMENT
OF GEODETIC
ENGINEERING**

FOREWORD



Head of Department of
Geodetic Engineering,
Prof. Dr. Bojan Stopar

*“The work and study at the
Department of Geodetic Engineering
offers numerous challenges in
profession.”*

The basic missions of the Department of Geodetic Engineering are teaching and research work in the areas of geodesy and engineering surveying, satellite geodesy and navigation, geodetic geophysics, cartography, photogrammetry and remote sensing, geoinformation, real estate management and spatial planning. These areas are engaged in the production and further use of location based data, which are the core of spatial data infrastructure. Today geodesy and geoinformation are the most important scientific fields for reference spatial systems determination and further spatial data infrastructure establishment. We need them for spatial data acquisition, recording and data representation. Quality spatial data infrastructure is the foundation for proper functioning and decision making in society and can be considered as equivalent to traffic, energy and telecommunication infrastructure. Our research work is implemented in cooperation with numerous other disciplines, with experts from the University of Ljubljana as well as from other universities, and with experts from research institutes and from the national and international companies.

We provide academic and master study programme Geodesy and Geoinformation, higher education professional programme Technical Real Estate Management and master study programme Spatial Planning. We educate professionals, who are capable to work in modern society, since the study gives them manifold engineering-technical and organisational knowledge and skills. For this reason the study includes knowledge from the areas of classical and modern technologies for the determination of location in space, monitoring of the Earth and mass acquisition, visualisation and analysis of spatial data, real estate management as well as spatial planning and spatial development.

The work and study at the Department of Geodetic Engineering offers numerous challenges in profession. We and our students accept these challenges and keep strengthening the foundations for successful development of our profession in the future.

The main purpose of the educational work at the Department of Geodetic Engineering is to give our students knowledge in line with the global development of the profession and science as well as the needs of organisations employing experts from the areas of geodesy and geoinformation, real estate management and spatial planning. The development of modern technologies for the acquisition, processing and representation of spatial data requires constant knowledge upgrading. At the same time, we strive to preserve classical technologies and procedures. Lecturers from practice and from research institutes are regularly invited to participate in our study process, students learn from practical cases, problems and solutions, visit different institutions and go on field trips. They have the opportunity to participate in projects and research work, and are encouraged to cooperate with the industry and other institutions in Slovenia and abroad.

With our teaching we strive to deliver our students the concepts for solving problems in geodesy and geodesy related professions by using different measurement technologies, as well as concepts for the analysis and representation of spatial data. Students learn about the methods of geodetic survey and other technological and methodological approaches to individual and mass acquisition of spatial data. They learn to critically assess the results obtained and use them for the elaboration of different kinds of classical and contemporary geodetic, geoinformation and cartographic products. The emphasis of our teaching is geoinformation and spatial data infrastructure, where we teach students about the concepts and technologies required to establish databases, their organisation and linking as well as the possibilities of their use. An important pillar of our studies is land management, where we teach students the basics of material law, real estate valuation, with a special emphasis on the areas of land administration (cadastres, real estate records, spatial units), land management and real estate and spatial planning.

The contents of our teaching include the basic pillars of the geodetic profession:

- Geodesy (reference systems and frames, satellite geodesy, geophysics);
- Technologies for individual and mass spatial data acquisition (classical and satellite-supported geodetic survey, engineering survey, photogrammetry, remote sensing, navigation);
- Geoinformation (geographic information systems, cartography, visualisation, spatial data processing and analysis);
- Land management (land administration, cadastres and real estate records, land consolidation and other types of land improvement, real estate valuation, spatial planning).

Students upgrade the acquired theoretical knowledge within seminar, laboratory and field tutorials, which include field work over several days.



We offer our students numerous possibilities of cooperation with other faculties in Slovenia and abroad. We are actively involved in the network of international student exchange, mainly through programmes such as ERASMUS and bilateral projects. We encourage students to apply to different tenders and calls and offer them our advice and guidelines, which help them turn their ideas to the intended results. The best diploma and master works are nominated for different awards, such as the Faculty and the University Prešeren Award, ESRI Award, etc.

The aim of the study is to educate professionals who will be able to work interdisciplinary on the areas of geodesy and geoinformation, real estate management, spatial and urban planning and environmental and organizational sciences. Such interdisciplinary knowledge is of key importance for the realization of different geodetic and civil engineering projects, real estate recording, geoinformation solutions, land or real estate management. This knowledge is also indispensable for space management and administration, spatial planning and management of spatial policies.



Our scientific, research and professional activities are evident from our participation in national and international projects.

At the national level we contribute to the development of new solutions and encourage the transfer of knowledge into practice, mainly by cooperating with the Surveying and Mapping Authority of the Republic of Slovenia and the Geodetic Institute of Slovenia. We cooperate with Slovenian ministries and other public and private institutions, developing solutions in the areas of geodetic and spatial data infrastructure, land administration and spatial planning. Especially worth mentioning are the activities in the area of basic geodetic reference system establishment, topographic data, cartographic solutions, and cadastres, and activities in the field of improvements of the land administration and geoinformation infrastructural system for sustainable development. Some of the topics of our research are the definition of the Earth's gravity field on the national level as well as the determination and monitoring of geodynamic activities at selected study areas. In the geoinformation area we develop modern solutions for the processing, representation and distribution of spatial data. A special emphasis is on the geoinformation and navigation solutions that support the decision making process in case of natural and other disasters. Our research work also relates to precise terrestrial surveying or engineering survey, with the focus on stability control of natural and built structures. With contemporary measuring technology and adequate procedures, continuously upgraded and developed, we monitor the stability of critical infrastructure in Slovenia, such as hydro power plants, nuclear power plant, thermal power plants and other major built structures and natural environment.



We devote permanent care to the maintenance of contacts with the economy, which is evident also from our successful cooperation with geodetic and other companies. Further on, we maintain lively cooperation in projects with local communities and prepare expert bases for spatial development documents. This includes issues such as management of land space, detailed planning of urban and other areas, development of urban systems and regional development, which have been, since Slovenia gained independence, closely connected to the wider international space. Today, our main focus is on sustainable regional spatial development, resistance of urban areas to global challenges of climate changes and other development factors, and the development of soft instruments and inclusion of the public in the processes of spatial development and planning.

Apart from cooperation in international projects we are also active in professional international organisations, such as International Union of Geodesy and Geophysics - IUGG, International Association of Geodesy - IAG, European Reference Frame - EUREF, International Society for Photogrammetry and Remote Sensing - ISPRS, International Cartographic Association - ICA, Fédération Internationale des Géomètres –FIG, etc.

We regularly check the results of our research and development work in cooperation with different agencies and publish the results of theoretic and scientific research in most important international journals, where we also cooperate as reviewers and members of editorial boards. We publish and review numerous papers in the scientific journal of the Association of Surveyors of Slovenia - Geodetski vestnik, which has lately acquired significant international response. Our staff represent also the majority of the editorial board, headed by Assoc. Prof. Dr. Anka Lisec, Editor-in-Chief.



**DEPARTMENT OF
ENVIRONMENTAL
CIVIL
ENGINEERING**

FOREWORD



Head of Department of
Environmental Civil Engineering
Assoc. Prof. Dr. Dušan Žagar

*“Water is a problem of the 21st
century – engineers of our profession
know the solutions.”*

The Department of Environmental Civil Engineering is located at Hajdrihova 28. The building also houses the Institute for Hydraulic Research, with which we have a prolific cooperation. Teaching is our primary mission – we offer 1st and 2nd cycle programmes Water Science and Environmental Engineering. We educate engineers for the challenges of the future; we give them a wealth of technical knowledge, built on the understanding of natural and social processes. In our time only interdisciplinary approaches can lead to solutions of increasingly complex engineering problems: flood and drought management, safe drinking water supply, wastewater treatment with latest technologies, low carbon energy production, efficient management of secondary materials and establishment of environmental technologies that enable planning and building the settlements of the future.

In order to teach, you first have to know. We are therefore actively involved in research work, where we cooperate with other departments of the Faculty, other faculties of the University of Ljubljana and numerous institutes and universities in Slovenia and abroad. Our research work involves important new achievements in the basic areas of fluid mechanics, hydrology and hydraulics and in highly specialised areas of hydraulic engineering, state-of-the-art wastewater treatment, green energy, pollutant and heat transport in the environment and the studies of global and local climate change.

Collaboration with industry is another important part of our activities. We believe only constant contact with practice can elucidate what society needs and what knowledge is required to successfully take on the global and local challenges now and in the future.

The Department of Environmental Civil Engineering is more than the sum of its parts. The employees and students are aware of their responsibilities and opportunities offered by the challenges of today and strive for excellence in their work.

At the Department of Environmental Civil Engineering we offer 1st and 2nd cycle programmes Water Science and Environmental Engineering. The study at the Department is contemporary and interdisciplinary. We successfully fill the gap between numerous programmes of the University of Ljubljana that focus either on natural sciences or on engineering. The study programme offers a wide expanse of knowledge and problem comprehension even at the first cycle level. The second cycle provides a more in-depth understanding and specialisation in different areas of water management. We give our students expert knowledge for solving current and future problems such as floods, droughts, food supply, water pollution, disposal and recycling of waste, etc. In this way the Faculty provides an integrated and modern study programme of the engineering aspects of environment protection and gives an important contribution to the store on knowledge for the third millennium.

The beginnings date in the year 1998, when the study was founded under the name Water Management and Municipal Engineering. In the academic year 1998/99 we enrolled the first generation of students, who by today have successfully embarked their careers and have paved the way for further generations of graduates. We follow our graduates also after their graduation and the latest analyses of gathered data show that even in these difficult times unemployment levels are very low among our graduates. Job opportunities for our students can be found in a wide array of public, water management, design engineer and construction companies, institutions and institutes across Slovenia and in some cases abroad, where our students are highly successful and valued. Altogether in each academic year we have between 100 and 150 students enrolled in our two study programmes. This relatively low number of students is one of the main advantages of this programme, since it enables work in smaller groups and a much more personalised relationship between teachers and students, which is one of the things



the Department is well known for among the students of our Faculty. Teaching takes place in a modern way and with advanced technology. The students have access to the departmental library, state-of-the-art laboratory and measurement equipment, as well as computerised virtual classroom and administration systems. With group, project, laboratory and field work and solving concrete problems and case studies, we provide students with practical knowledge and skills. This is also evident in the fact that in the last two years, under the mentorship of our professors and in cooperation with different companies, our students were involved in six different projects under the joint name “Creative Path to Practical Knowledge” and were all very successful. One of the project groups prepared a conceptual project of a standing wave for surfing on the river Sava. They are currently negotiating the implementation of their idea. Among other skills obtained by students in our institution is also public speaking in front of expert and lay public and business transaction skills with clients in administrative procedures, public tenders and building and measure planning. The aim of the programmes is also to familiarise the students with the basic engineering expertise to an extent that the graduates can successfully continue their second and third cycle studies on other programmes. It is therefore not surprising that our graduates receive numerous awards and prizes, e.g. the Prešeren award, Pomurska research award, Goljevšček award, Saubermacher award, etc. So far, more than 15 theses have received prizes.

Our programme is interdisciplinary and therefore includes many teaching staff from other faculties of the University of Ljubljana (Biotechnical, Philosophical, Economic Faculty and Faculty of Chemistry and Chemical Technology) and our teachers also participate in the study programmes of other faculties. International cooperation includes inter-university student and teaching staff exchange, but it is not limited only to that. We are actively involved in the international study programme of flood risk management with foreign universities (Dresden, Barcelona and Delft). Modernisation and internationalisation of study programmes also requires parallel course execution in English, a feature the Department is currently preparing for.





R&D AND CONSULTING

Despite a relatively small number of researchers we are lead or collaborating partners in international projects funded by EU framework programmes, as well as UNESCO programmes, cross-border and bilateral projects. We also have national basic and applied research projects and take part in the program group “Water Science and Geotechnics”. The Hydraulic laboratory with its modern equipment offers a wide range of possible research opportunities in the fields of water flow and matter and heat transport, as well as design safety of hydraulic and energy constructions. Large part of our research work deals with drinking water supply, wastewater treatment involving hydrodynamic cavitation and ultrafiltration, losses in water supply networks and cross-border water supply capabilities. In the two Sanitary Engineering laboratories we undertake research into advanced technologies of industrial wastewater treatment and energy production from biogas, while our state-of-the-art measurement equipment enables us to perform complex biochemical and geomechanical analyses (gas chromatography, granulation and suspended solid deposition). We research infrastructure and cities of the future with low energy consumption and minimal use of secondary resources. In our research we collaborate with other departments and faculties within the University of Ljubljana as well as other Slovenian research institutions, because prerequisites for our work include geomechanics, remote sensing and data acquisition, material science and secondary resource recycling. We develop new software, especially numerical models within protection against natural disasters (dam breaks, embankment collapses, floods, landslides and mudslides) and models calculating transport and transformations of pollutants in the environment. Part of our research is also the development and manufacture of specific equipment for performing measurements in rivers and data transfer from the field to the laboratory.

At the Department of Environmental Civil Engineering we also publish *Acta Hydrotechnica*, the only Slovenian scientific journal in the field of hydrology, hydraulics, water protection and other issues connected to waters. The success of scientific research work of the Department is also evident from the numerous invited lectures at universities and symposia abroad, membership in editorial boards of leading journals and numerous publications in globally recognised journals and monographs.

We also strive to apply the findings of our research in practice as soon as possible. We have ongoing collaboration with industry and the non-commercial sector. By cooperating with ministries and big companies, we make the results of our research useful to society. Applications developed at the Department of Environmental Civil Engineering are used in hydro-energy production, extreme event predictions and environment protection. Cooperation with small enterprises in the field of water management, hydraulic structures and secondary resource management enables the transfer and practical use of specific expertise. Our professional work is not limited only to Slovenia; in the recent flood events in Bosnia and Herzegovina, we provided expert solutions in the scope of international aid. Experts from our Department collaborate as design engineers and auditors of project documentation in water management and hydraulics. We are also active within the Chamber of Engineers, as our experts participate in areas Civil Engineering and Technology, both areas where our graduates can obtain authorisation as responsible designers. Some of our staff members are partially employed in companies. In this way we can achieve direct knowledge transfer from research into practice and, perhaps even more importantly, direct experience transfer from engineering practice to the teaching, which is the first and most important mission of the University, of our Faculty and of the Department of Environmental Civil Engineering.



ABOUT STUDENTS

STUDENT ORGANIZATIONS

Student Board of the Faculty of Civil and Geodetic Engineering (ŠS FGG) and Student Organization of the Faculty of Civil and Geodetic Engineering (ŠO FGG) both take care of our students at the faculty and university level. They offer students opportunity to co-create study process and student politics.

ŠS FGG is a faculty authority that brings together representatives of all first and second cycle studies and a representative of the third cycle studies. Through this board students can pass on their opinions and comments about the study process at the faculty. It represents the main communication channel between students and the faculty management. ŠS FGG has a student member in several commissions, senate, academic assembly and study boards. Their main task is to give opinions about teachers for their academic advancement.

ŠO FGG is an organization that has less formal role than ŠS FGG. Its priority is to make students feel good at the Faculty and to offer them extracurricular activities in their free time. They represent FGG in broader student organization structure of the University of Ljubljana (ŠOU). General positivity and sense of belongingness at the FGG are created by numerous actions, such as: unique tarock cards with motives from built environment in Slovenia, sweaters with ŠO FGG logo, activities in the faculty halls (e.g. toast day) or outside of the faculty (blood donation events).

Both ŠS FGG and ŠO FGG organise social and informal educational events, computer courses, field trips and visits of construction sites.

There are three active student associations of FGG, one for each department: at the Department of Civil Engineering there is Civil Engineering Student Association (DŠG),

at the Department of Geodetic Engineering there is Slovenian Geodetic Student Association (DŠGS) and at the Department of Environmental Civil Engineering there is Water Management Student Association (DŠV). All associations aim at motivating bonding among students in their free time and for this purpose they organize many educational field trips, informal types of education, stalls, parties and other activities. Activities primarily follow the specific field of study, although also all other interested students are always welcome.

Most popular type of these activities is educational field trips. To mention just a few of them: every year DŠG takes its members to a distant educational field trip (for example Dubai, Brazil, Middle East). Further on, DŠGS takes part in Regional meeting of geodetic students (meeting of students from former Yugoslavian countries), while DŠV gives students educational insight in some of the recent constructional interventions in natural environment, as for example rehabilitation of landslide Slano Blato, dam Vajont or port Luka Koper.

Due to their unique sweaters and T-shirts, members of these associations are well recognised at our Faculty. For the purpose of some major social events they all get together and in that way motivate students to socialize and broaden their horizons.

In the last few years it has become increasingly popular among students to take part at projects, such as those financed by the European Structural Funds, which offer students cooperation with industry and address problems with the help of professors and selected industry professionals. The most resounding project of last year was Modelling of standing wave for water sports, for which students found an appropriate location on River Sava by Brežice hydropower plant. Another group of

students showed their creativity without the help of public tenders – they invented a drone (quadcopter) that collects spatial data using camera, within a project called Fly Eye.

Students were also invited to participate in shaping different open areas at the Faculty. The first call was for the interior design of the Faculty lobby, which is under protection as cultural heritage. The winning team of students proposed and carried out renovation by offering more space for socialising and work (sofas, desks, computers, printbox, etc.). The project helped to transform the lobby from an entry area of the Faculty to a multipurpose space. The second call was for the interior design of a study corner in the first floor of the Faculty. The winning solution for the study corner will offer students comfortable place for study and team work.

There are two kinds of tutoring programmes available at FGG: teacher tutoring and student tutoring. Students help their colleagues in the process of getting used to the study programmes or in coping with difficult subjects where extra help is needed:

- introductory student tutoring,
- course student tutoring,
- student tutoring for students with special needs and
- student tutoring for foreign students.

Tutoring is more than help among colleagues – students learn how to deal with stress or how to organise their time. In addition, student tutors improve their soft skills. Tutoring connects students from different stages of study and some may become friends for life.



STUDY ABROAD AND FOREIGN STUDENTS AT THE UL FGG

Many students decide to do a part of their study or internship abroad. There are different exchange options, but currently the most popular are Erasmus+, CEEPUS or Basileus. In this way, students gain valuable life experiences; they get the opportunity to compare and exchange their knowledge with other colleagues from around the world as well as to learn a foreign

language and how to deal with new situations in unknown environment. Since there is a wide variety of available destinations, the number of our students taking this opportunity is increasing. On the other hand, the number of foreign students coming to our faculty is also rising. They all return to their home universities richer with new knowledge and experiences.

Barbara Novak,
student exchange in Porto

I decided for the exchange because I wanted to know what it is like to study and live abroad and to learn about other cultures. The experience was interesting and I don't regret my decision.



Maria Kupryjaniuk,
student exchange from Poland

For me studying at FGG is easy. Every step of my education here is simply explained. I know about my courses, recruitment process, possibilities of taking sport activities, course of Slovenian language, software and lectures.



STUDENTS' SOCIAL LIFE



To provide a pleasant reading during a break or a dull hour we publish our student magazine called *Most (Bridge)*, which is published six times a year with contributions from our students. It is distributed free of charge. Editorial board is primarily composed of students (editor, co-editors, designer, language editor and writers of articles). The mission and the main purpose of the magazine are to inform students and other readers about the latest events at the UL FGG, to publish expert articles from the field of civil engineering, water management, environmental engineering and geodesy. It also publishes student impressions about studies and extracurricular activities and informs readers about news in engineering and current projects.

Throughout the academic year students of the UL FGG may choose among various social and sports activities, such as skiing, sailing, various sports competitions, etc. Our faculty also has active sports teams, like male soccer, basketball, volleyball and women volleyball teams.



In the autumn and spring months students can also attend interesting sports activities in nature, such as hiking, mountaineering school, cycling tours, sailing courses and for the adrenalin enthusiasts also rafting and kayaking. In the winter months they can attend longer, multi-day hikes and skiing courses. At the end of each academic year they can socialize in a pleasant and relaxed company at the five-day sports and eco-camp in mountain area of Tolmin.

Many cultural activities also take place in the main hall of the Faculty - from dance lessons to exhibitions of various projects and competitions.



Dejan Bolarič, 3rd year CE, BA

Study of Civil Engineering is very dynamic and motivates students to think with their own heads. As a civil engineer, I am inspired by the responsibility for the built environment, future users and the economy.

Benjamin Cerar, 1st year CE, BA

Study of Civil Engineering offers a lot more than one might think; pragmatic and rational thinking, so you would be as engineer efficient at your work, is just a start. Study itself requires a lot of commitment, but because of the quality of its contents and good teachers it is not boring at all.

Karin Tomažič, 1st year CE, MA

Programme of study at our Faculty is diverse and interesting. It enables the development of creativity in different fields. Professors are always there for students and are very supporting.

Jure Česnik, 2nd year CE, MA

I will not say that this is the easiest or hardest faculty, but it is definitely faculty for the best companionship and socialization among students. Thanks to our active student associations and organization, when I enter FGG I feel like entering a great, cheerful and active society of young people.



STUDENTS ABOUT US

**Department of
Civil Engineering**

Meta Krivic, 2nd year G&G

Study process at the Faculty is dynamic and it offers a lot of mathematics and physics related contents, so you should be scientist in heart. There is a lot of fieldwork on one hand and a lot of computer related work on the other. What I like most is that classes are small and the professor can focus on every individual.



Polona Zorinič, 1st year G&G

This programme was undoubtedly the best choice for me. Every day I meet nice professors who are always ready to help students. Other students are also very cheerful and full of positive energy. I made the right decision to choose this faculty.



Rok Urbanija, 1st year G&G, MA

I decided for the study program Geodesy and Geoinformation because I am interested in this area, which made my choice easy. The study fulfilled my expectations; I learned a lot and made many new friends. The only thing I missed was some more practical training.



STUDENTS ABOUT US

**Department of
Geodetic Engineering**

Martina Rakuša, G&G, MA

I like the study very much, since it is strongly connected to the current situation of geodesy in practice. The communication between students and teachers at the master level is more relaxed. As students we are closely connected also outside the Faculty, we help each other, especially by exchanging study materials and other information.



Miha Kračun, 2nd year WSEI, MA

Study of Water Science and Environmental Engineering offers a wide range of knowledge and skills for solving a variety of problems from basic administrative to purely technical problems. I recommend it to anyone who likes to look around and see a variety of problems and the beauty of the environment in which we live every day.



Tilen Koranter, 1st year WSEI, MA

"We will never run out of garbage, but water will soon be more expensive than oil." This was a thought going through my mind when I was deciding what to study. Indeed., in Water Science and Environmental Engineering study we deal with waste management, water resource management and system management.

Petra Žnidaršič, 2nd year WSEI, MA

I like it that professors share their knowledge in the form of practical examples and advice. They don't fill our heads with irrelevant information, but they teach us logical and practical thinking. In any way, faculty cannot prepare you for everything that awaits you in your life. But it can teach you how to effectively deal with problems on your way.

Katarina Vodeb, 2nd year WSEI, BA

Study of Water Science and Environmental Engineering is very broad and up-to-date. I live in a flood area, so I've always been interested in environmental issues. I can use the knowledge from the study in my everyday life and I believe that with this knowledge I can work in various fields.



STUDENTS ABOUT US

**Department of
Environmental Civil
Engineering**



Univerza v Ljubljani
Fakulteta za gradbeništvo
in geodezijo



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VISION OF THE UL FGG

Until 2025, to be among the best departments in the areas of civil engineering, environmental engineering and geodetic engineering in Central Europe.

- To raise the quality of research work to the highest international level.
- To continuously improve and modernise study programmes and the quality of educational work.
- To raise the importance and quality of engineering education and engineering profession in modern society.
- To get better involved in the solving of developmental and professional issues in Slovenia and internationally.