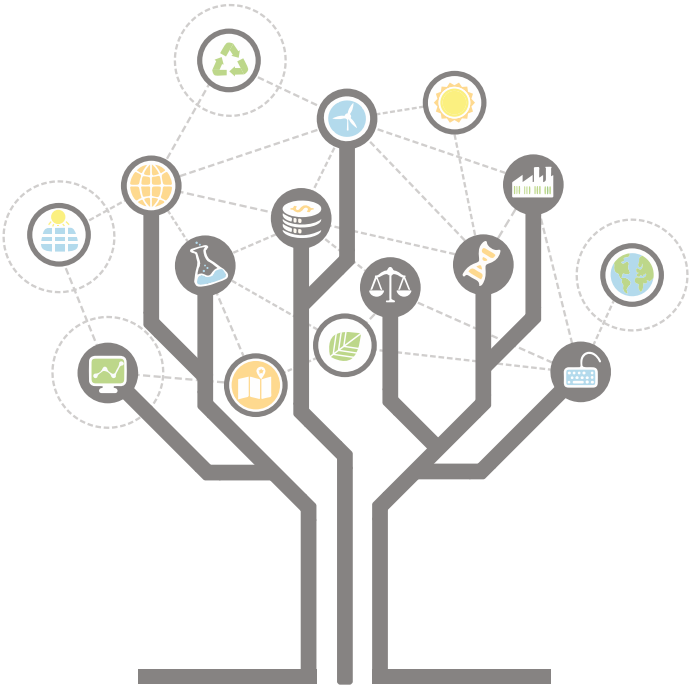
FACULTY OF GEOTECHNICAL ENGINEERING
UNIVERSITY OF ZAGREB

SELF-ANALYSIS

UNIVERSITY OF ZAGREB
FACULTY OF GEOTECHNICAL ENGINEERING

FOR THE PURPOSE OF THE RE-ACCREDITATION OF THE HIGHER EDUCATION INSTITUTION BY THE AGENCY FOR SCIENCE AND HIGHER EDUCATION IN 2025



VARAŽDIN, 2025

Name and the address of the higher education institution:	University of Zagreb, Faculty of Geotechnical Engineering Hallerova aleja 7 42000 Varaždin, The Republic of Croatia
Year of establishment:	1969. Independent constituent unit of the University of Zagreb since 1 October 1991
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Coordinator of the Working Group:	Prof. Ranko Biondić, PhD, Chair of the Quality Assurance Committee
Date of appointment of the Working Group:	11 December 2024, at the 3rd regular session of the Faculty Council of the Faculty of Geotechnical Engineering
Period covered by the Self-Analysis:	2020–2024; Academic Year 2023/2024
Date of adoption of the Self-Analysis:	1 September 2025, at the 17th extraordinary session of the Faculty Council in the Academic Year 2024/2025

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1. INTRODUCTION

The Self-Analysis covers a period of five academic years: 2019/2020, 2020/2021, 2021/2022, 2022/2023, and 2023/2024, as well as five calendar years: 2020, 2021, 2022, 2023, and 2024. In preparing the Self-Analysis, data were drawn from various sources: Information System of Higher Education Institutions (ISVU), Croatian Research Information System (CRORIS), internal databases of the Faculty of Geotechnical Engineering, as well as the Statute, regulations, and decisions of the Faculty. Particular attention was given to the recommendations arising from previous evaluation procedures.

1.1. Historical Development of the Faculty of Geotechnical Engineering

For over 50 years, the Faculty of Geotechnical Engineering has represented the core of higher education in the field of engineering in the northwestern part of the Republic of Croatia. It is one of three constituent units of the University of Zagreb located outside of Zagreb, and the only faculty within the University's technical field authorized to deliver university-level programs in Varaždin.

Throughout its history, the present-day Faculty of Geotechnical Engineering has undergone changes in orientation, name, and location. Higher education in this field began with the establishment of the **Higher Technical School of Mining and Geophysical Exploration in Varaždin**, founded by a decision of the Council for the Education of Oil, Geophysical Exploration, Mining, and Metallurgical Personnel in Varaždin on September 20, 1969. By a ruling of the District Commercial Court in Zagreb on December 11, 1970, and upon the proposal of the School's Working Community, the name was changed to the **Higher Geotechnical School Varaždin**. The establishment of this School was supported by several industrial organizations at the time, most notably: "Geotehnika" Zagreb, "Geofizika" Zagreb, "Geosonda" Belgrade, "Geoistraga" Sarajevo, and the Geological Institute in Ljubljana. Teaching at the Higher Geotechnical School was organized in three courses—Geotechnics, Hydrotechnics, and Surface Mining & Quarries—and lasted five semesters. At that time, there was strong demand throughout the former state for this professional profile. In the early years, more than fifty students graduated annually. In 1974, in response to requests from construction companies, a new course in Civil Engineering was introduced.

As of September 4, 1972, the Higher Geotechnical School Varaždin **operated within the Faculty of Mining, Geology and Petroleum Engineering at the University of Zagreb**. Classes were conducted by 17 full-time staff based in Varaždin, together with lecturers from the Faculty of Mining, Geology and Petroleum Engineering and the Faculty of Civil Engineering in Zagreb.

During its existence, the Higher Geotechnical School Varaždin established strong collaboration with companies across Croatia through professional projects in geotechnical and hydrotechnical works. This cooperation enabled the expansion of school facilities, the equipping of laboratories, the acquisition of fieldwork equipment, and the professional development of its staff.

As the study programs developed, the original building on Hinkovićeva Street 1 (today Hallerova Aleja 1) became too small, leading to the **construction of a new building** at Hinkovićeva Street 7 (today Hallerova Aleja 7), largely completed in 1976. Later expansions included the addition of a third floor

in 1985 and the construction of the Great Lecture Hall – Aula Magna (2010), with 235 seats. This is the building where the Faculty remains to this day.

The rapid development of the construction industry in Varaždin County in the early 1970s created a demand for civil engineering professionals. Therefore, in 1974, the Higher Geotechnical School **started a civil engineering program at level VI** (higher professional qualification), lasting five semesters, with a specialization in Building Construction. In 1977/1978, this program was upgraded to align fully with the level VI program at the University of Zagreb's Faculty of Civil Engineering Sciences. For two cohorts, a **level VII/1 program** was also offered, leading to the title of **Master of Civil Engineering** with a specialization in Construction Organization and Economics. Teaching for both full-time and part-time students was held in Varaždin, while final examinations were conducted in Zagreb before a joint committee of the Faculty of Civil Engineering Sciences and the Higher Geotechnical School. Lecturers included faculty from the Faculty of Civil Engineering Sciences, the Higher Geotechnical School, the Faculty of Organization and Informatics, and practicing experts from Varaždin and Čakovec. This joint civil engineering program operated successfully from 1977/1978 until 1991/1992. Following an agreement among the University's technical faculties, placement examinations were conducted at the Faculty of Civil Engineering Sciences in Zagreb. However, in 1992 and 1993, fewer than 15 candidates passed the exam, below the minimum number required to continue offering the program in Varaždin, leading to its closure once enrolled students completed their studies.

The Higher Geotechnical School operated until 1991, when it was upgraded into the **Faculty of Geotechnical Engineering**, becoming an independent constituent unit of the University of Zagreb. In May 1990, approval was requested from the Ministry of Education and Culture to launch a level VII/1 university program in Geotechnical Engineering, and to change the institution's name to the Faculty of Geotechnical Engineering in Varaždin. This approval was granted on February 12, 1991, and by October 28, 1991, the Ministry of Science, Technology, and Informatics officially registered the Faculty of Geotechnical Engineering in Varaždin as a scientific-teaching organization

With this approval, the Faculty admitted its first students to the university-level program, which was delivered in two specializations: Geotechnics and Hydrotechnics. In 1997, the University of Zagreb undertook a comprehensive revision of curricula, including course syllabi. After this revision, the Faculty's study programs remained focused on Geotechnics and Hydrotechnics, but shifted further away from mining and closer toward civil engineering.

In 1993/1994, the Faculty also established a study program in „Technical Environmental Protection". Seven students enrolled and graduated, most of whom went on to careers in environmental protection

The last cohorts of students enrolled in the Geotechnics and Hydrotechnics courses of the Geotechnical Engineering program in 2004/2005. In 2005, the Faculty introduced a Bologna-aligned university program in Geoengineering, designed both to preserve its tradition in Geotechnics and Hydrotechnics and to shift toward Environmental Engineering. For the first time, Environmental Engineering was introduced as a study course.

The Faculty played a proactive role in promoting Environmental Engineering within Croatian legislation, seeking its recognition as a discipline already widely established internationally. In December 2005, the Faculty initiated the process of including Environmental Engineering in the official

Classification of Scientific and Artistic Fields, Disciplines, and Areas. In 2008, Environmental Engineering was officially listed as a subfield within General Technical Sciences, and in 2009 it was reclassified as a subfield within Interdisciplinary Technical Sciences. In the most recent classification (OG 3/2024), Environmental Engineering (2.16.01) remains within Interdisciplinary Technical Sciences (2.16)

The growing focus on environmental protection and management in engineering terms brought a new transition, further orienting study programs toward Environmental Engineering. The Faculty has since become one of the leading institutions for Environmental Engineering at the University of Zagreb and nationally

The undergraduate university program in Environmental Engineering was introduced in 2012, replacing the undergraduate program in Geoengineering, while the graduate university program in Environmental Engineering was launched in 2015, replacing the graduate Geoengineering program.

In 2018, the Faculty initiated a postgraduate doctoral program in Environmental Engineering, thus completing the transition of all study levels toward Environmental Engineering.

In 2021/2022, part-time (professional) studies in Environmental Engineering were introduced at both undergraduate and graduate levels, enabling study opportunities for working students.

Since 2004, the Faculty has also actively participated, together with 12 other constituent units of the University of Zagreb, in the conducting of the postgraduate specialist university program in „Eco-Engineering“. Faculty members are actively engaged in teaching, serving on the Academic Council, and mentoring or participating in committees for final theses.

1.2. Activities and Organization of the Faculty of Geotechnical Engineering

The Faculty of Geotechnical Engineering is an independent constituent unit of the University of Zagreb and holds the status of a legal entity. It is registered in the Commercial Court Register in Varaždin, in the Register of Scientific Organizations, and in the Register of Higher Education Institutions:

- CroRIS ID: 107
- Register of Scientific Organizations (abolished on October 22, 2022) entry no. 160 in the field of Technical Sciences; Decision on the approval for performing scientific activity (Class: 640-02/95-01/001, Reg. No: 533-02-160-95-2, dated February 15, 1996)
- Register of Higher Education Institutions of the Ministry of Science, Education and Youth; Decision on entry in the Register (Class: UP/1602-04/02-07/61, Reg. No: 533-12/800-02-1, dated September 30, 2002)
- Court Register of the Commercial Court in Varaždin, under the Ministry of Justice, Public Administration and Digital Transformation, Registered ID: 070047983
- EU Funding & Tenders Portal - PIC number: 873273832 (University of Zagreb Faculty of Geotechnical Engineering)

The Faculty's primary activities include the organization and delivery of undergraduate, graduate, and postgraduate university and professional study programs, the implementation of scientific and

development projects, as well as the conduct of scientific and professional work in the fields of technical, natural, and interdisciplinary sciences.

The Faculty operates in compliance with the fundamental laws and regulations governing science and higher education in the Republic of Croatia, including: The Act on Higher Education and Scientific Activity (OG 119/2022), The Act on Quality Assurance in Higher Education and Science (OG 151/2022), The Act on Academic and Professional Titles and Degrees (OG 107/2007, 118/2012), Croatian Qualifications Framework Act (OG 22/2013, 41/2016, 64/2018, 47/2020, 20/2021), The Act on the Student Council and Other Student Organizations (OG 71/2007), and The Ordinance on the Form and Content of Certificates, Diplomas, and Diploma Supplements (OG 74/2023).

In addition to these laws and regulations, the Faculty operates under The Statute of the University of Zagreb (2023), The University of Zagreb Quality Assurance Ordinance (2018), and The Statute of the Faculty of Geotechnical Engineering (2023).

The Faculty further aligns its activities with numerous regulations deriving from statutory provisions, including: The Ordinance on the Recognition of Prior Informal and Non-formal Learning of the University of Zagreb (2024), The Ordinance on Lifelong Learning of the University of Zagreb (2024), The Ordinance on the Evaluation of Study Programs of the University of Zagreb (2024), The Ordinance on Undergraduate and Graduate Studies at the University of Zagreb (2024), The Ordinance on Undergraduate and Graduate Studies at the Faculty of Geotechnical Engineering, University of Zagreb (2024), The Ordinance on Doctoral Studies at the University of Zagreb (2024), The Ordinance on Internal Organization and Job Classification of the Faculty of Geotechnical Engineering, University of Zagreb (2024), and The Ordinance on Employment of the Faculty of Geotechnical Engineering at the University of Zagreb (2023)

The current strategic documents of the Faculty are:

- Development Strategy of the Faculty of Geotechnical Engineering 2023–2027 (link HR, link ENG)
- Scientific Research Strategy of the Faculty of Geotechnical Engineering 2023–2027 (link HR, link ENG)

In accordance with The Statute of the Faculty of Geotechnical Engineering (2023) (link HR, link ENG), the Faculty's activities include:

- organizing and conducting undergraduate, graduate, and postgraduate university and professional study programs in the field of technical sciences, interdisciplinary technical sciences, civil engineering, and related fields;
- organizing and conducting scientific and development projects, as well as scientific and professional work in the technical, natural, and interdisciplinary sciences;
- organizing and implementing continuing education, lifelong learning, and adult education programs;
- organizing seminars, conferences, congresses, and other scientific and professional events;
- publishing books, periodicals, and other academic publications;
- providing consultations and training related to project applications and project management;

- architectural and engineering activities, including related technical consulting;
- research and experimental development in the natural, technical, and interdisciplinary sciences;
- technical testing and analysis;
- design, preparation of investment and technical documentation, technical supervision, expert assessments, and evaluations in civil engineering and mining;
- organization and execution of building projects;
- preparation of business plans, programs, and execution of geotechnical, hydrological, and hydrotechnical studies and projects, as well as projects in environmental engineering, including expert opinions, studies, consulting, expertise, and supervision;
- test drilling and boring for construction purposes;
- development of geographic information systems (GIS);
- water exploration and other hydrogeological work: hydrogeological investigations, geophysical surveys, drilling of exploratory boreholes and wells;
- geotechnical and hydrological measurements and modelling, geochemical and hydrogeochemical measurements and analyses;
- preparation and implementation of research programs and interpretation of results in assessing the quality of air, water, and soil;
- professional environmental protection services;
- aerial surveying;
- execution of geodetic work in accordance with the Act on the Performance of Geodetic Activities.

In addition to the above, the Faculty may also perform other activities that support the stated purposes, provided they are carried out to a minor extent or are customarily performed alongside the described activities

The structure and organization of the Faculty of Geotechnical Engineering are defined by The Statute of the Faculty of Geotechnical Engineering (2023), in alignment with The Statute of the University of Zagreb (2023) and The Act on Higher Education and Scientific Activity (OG 151/2022)

ORGANIZATIONAL CHART OF THE FACULTY OF GEOTECHNICAL ENGINEERING

The organizational structure comprises the following core units (Figure 1): departments, laboratories, the Centre for Research and Student Support (hereinafter: CEPIS), the Office for Quality Management (hereinafter: URKVA-GFV), the Secretariat, the Accounting Office, and the Library. The Secretariat, Accounting Office, Library, CEPIS, and URKVA-GFV are integrated and operate as the Dean's Office, managed by the Dean. The structure and scope of activities of each organizational unit of the Faculty are determined by separate general acts of the Faculty.

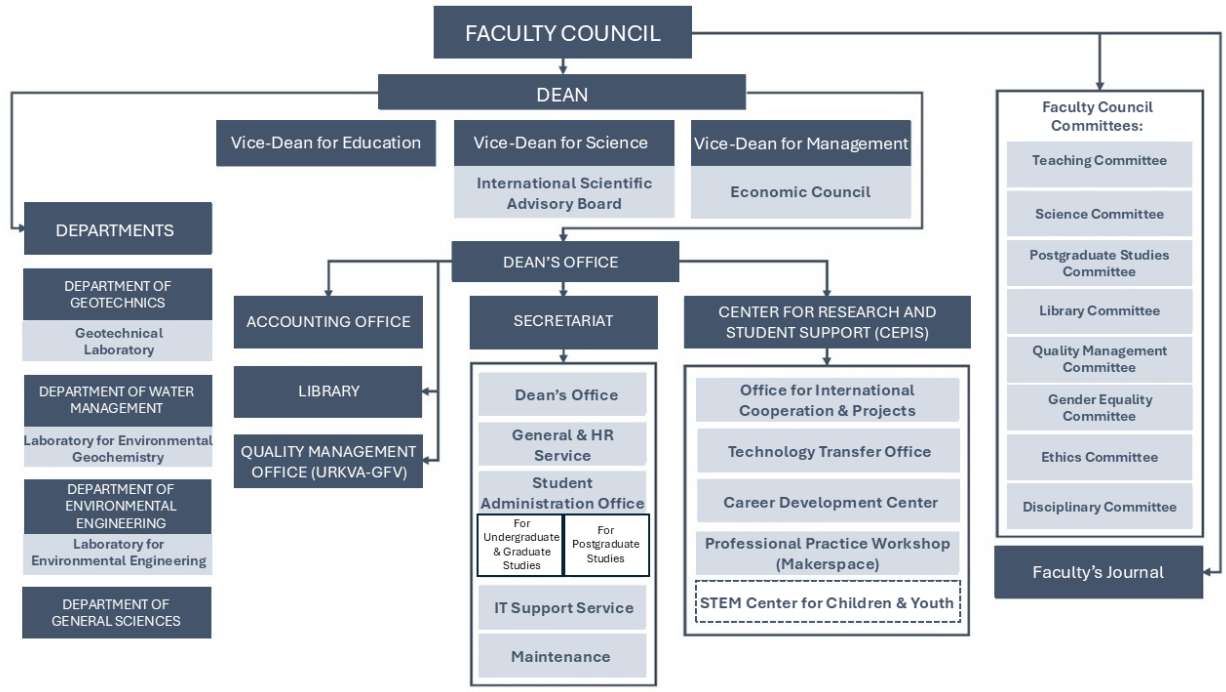


Figure 1. Organizational Structure of the Faculty of Geotechnical Engineering according to the Statute of the Faculty (2023), with amendments based on decisions adopted in 2024

DEPARTMENTS

Teaching, scientific research, and professional activities at the Faculty of Geotechnical Engineering are carried out through its fundamental organizational units – the departments.

In accordance with Article 7, paragraph 3 of The Ordinance on Internal Organization and Job Classification (2024), the responsibilities of the departments include: organizing and delivering teaching, scientific, and professional activities; supporting the professional development of staff, particularly junior researchers and assistants; overseeing the work and development of laboratories; proposing changes to the curriculum and teaching plans; proposing staffing solutions in line with needs in teaching, research, and professional activities; recommending scientific and professional training in Croatia and abroad; discussing and providing opinions and proposals on matters important for the operation of the department and the Faculty; and recommending the acquisition of scientific, teaching, and professional literature, equipment, and technical resources

The Faculty of Geotechnical Engineering consists of four departments, further information about which is available on their respective websites: The Department of General Sciences, The Department of Geotechnics, The Department of Water Management, and The Department of Environmental Engineering. Each department is headed by a Department Head.

LABORATORIES

In accordance with Article 32 of The Statute of the Faculty of Geotechnical Engineering (2023), laboratories have also been established with the aim of enhancing the quality of scientific research, fostering the development of new technologies and discoveries, providing services to the community, and supporting student career development through the acquisition of practical experience. Within

the Department of Geotechnics, The Geotechnical Laboratory and the Geotechnical Practicum have been established; within the Department of Water Management, The Environmental Geochemistry Laboratory and the Chemical Practicum have been established; and within the Department of Environmental Engineering, The Environmental Engineering Laboratory has been established. Additionally, an integrated virtual laboratory (VIRTULAB) has been set up. Each laboratory is managed by a Laboratory Head.

CEPIS

The Centre for Research and Student Support (CEPIS), in accordance with Article 33 of The Statute of the Faculty of Geotechnical Engineering (2023), is an organizational unit of the Faculty that provides support to students and researchers in conducting research and developing new technologies, fostering interdisciplinarity, multidisciplinary, creativity, and innovation, as well as supporting student career development

CEPIS consists of the following offices and units: the Office for International Cooperation and Projects, the Technology Transfer Office, the Career Development Centre, and the Professional Practice Workshop (Makerspace)

- **Office for International Cooperation and Projects**

The mission of the Office is to promote mobility of students, teaching, and non-teaching staff; to encourage scientific cooperation within interfaculty agreements; to support participation in and proposal of scientific research projects funded by national and international funds and foundations; and to stimulate participation in European Union scientific projects, particularly COST (European Cooperation in Science and Technology) actions. The Office is also involved in the preparation and implementation of the Faculty's scientific research strategy and provides professional and administrative support to the Science Committee, as well as performing other tasks related to promoting scientific research excellence as directed by the Dean and Vice-Dean for Science. Key activities in international cooperation include student exchanges, ERASMUS+ agreements, and COST projects.

- **Technology Transfer Office (TTO)**

In accordance with The National Guidelines for Technology and Knowledge Transfer (2022), the TTO of the Faculty of Geotechnical Engineering is classified as a smaller office that collaborates, when necessary, with the central TTO of the University of Zagreb. Technology transfer is a process through which research results are legally protected, their commercial potential is assessed, and they are brought to market—that is, technology transfer represents the commercialization of inventions resulting from research.

The TTO operates in compliance with The Intellectual Property Management Ordinance of the University of Zagreb (2022), The Intellectual Property Management Guidelines of the University of Zagreb (2022), The Decision on Intellectual Property Management at the Faculty of Geotechnical Engineering (2024), and The Decision on the Appointment of the Head of the Technology Transfer Office (2024)

The Office's core activities include providing consulting services to Faculty researchers in areas such as licensing, market analysis, cost-benefit analysis, and marketing services.

- **Career Development Centre of the Faculty of Geotechnical Engineering (CDC)**

To provide support to students during their professional practice, offer career counselling when entering the labour market, and assist with employment or further academic development, the need arose to establish a career centre at the Faculty of Geotechnical Engineering.

At the Faculty Council session held on September 23, 2020, during the 2019/2020 academic year, the Career Development Centre (CDC) was founded as a project obligation within the ESF project UP.03.1.1.04.0059 "Acquiring Key Practical Skills in Environmental Engineering". The CDC was initially established as an office within the Dean's Office. Following the adoption of the new Statute of the Faculty of Geotechnical Engineering (2023), the CDC was formally integrated into the new organizational structure of the Faculty and has since operated independently of project activities as part of CEPIS. The Head of the CDC represents and manages the Centre, and is appointed by the Dean.

The CDC has a permanent mission to assist students during their studies in career orientation and in achieving competencies for early career development. It plays a particularly active role in organizing Career Days, mentoring workshops, monitoring the implementation of professional practice organized at the Faculty, delivering career counselling training, and carrying out all other activities that benefit students.

- **STEM Centre for Children and Youth (STEM Centre)**

The STEM Centre was formally established in 2023, and a Head of the STEM Centre was appointed in the same year. The STEM Centre was initially created within the ESF project No. UP.04.2.1.10.0076: "STEM Centre for Children and Youth". Upon the project's completion, it was formally integrated into the organizational structure of the Faculty of Geotechnical Engineering.

Through the STEM Centre, the relationship between science and the public is creatively developed, mediated by civil society organizations. It also implements activities aimed at promoting cooperation between civil society and the higher education sector, as well as advancing STEM popularization at local, regional, and national levels.

SECRETARIAT

In accordance with Article 35 of the Statute of the Faculty of Geotechnical Engineering (2023), the Secretariat is an organizational unit of the Faculty responsible for organizing and performing professional, administrative, technical, and support tasks that ensure the regular operation of the Faculty. The Secretariat consists of the following offices: the Dean's Office, the General and Human Resources Office, the Student Administration Office, the IT Support Office, and the Facilities and Property Maintenance Office. The Secretariat is managed by the Faculty Secretary, who supports the Dean and Vice-Deans in their work.

ACCOUNTING OFFICE

In accordance with Article 36 of the Statute of the Faculty of Geotechnical Engineering (2023), the Accounting Office is an organizational unit of the Faculty that organizes and performs bookkeeping,

financial operations, and material management. The Head of Accounting is responsible for the work of the Office to the Vice-Dean for Management and to the Dean.

LIBRARY

In accordance with Article 37 of the Statute of the Faculty of Geotechnical Engineering (2023), the Library is an organizational unit of the Faculty and forms part of the University's library system. The organization and scope of the Library's activities, the work of library staff, and library management are regulated by a general act of the Faculty. The Head of the Library is accountable to the Vice-Dean for Education and to the Dean. Oversight of the development and functioning of the library system is exercised by the Library Committee, appointed by the Faculty Council upon the Dean's proposal. The work of the Library is regulated by the Library Rules of the Faculty of Geotechnical Engineering (2019).

1.3. Mission, Vision, and Values of the Faculty of Geotechnical Engineering

The mission and vision of the Faculty are defined in the Development Strategy of the Faculty of Geotechnical Engineering, University of Zagreb, for the period 2023–2027. The Strategy was adopted at the 6th extraordinary session of the Faculty Council in the 2022/2023 academic year, held on January 20, 2023. In addition to the mission and vision, the Development Strategy also sets forth the general strategic objectives for development, as well as specific strategic objectives across key areas of activity.

MISSION

The mission of the Faculty of Geotechnical Engineering is to conduct scientific research and deliver research-based higher education in the interdisciplinary field of environmental engineering, as well as to facilitate the transfer and application of knowledge to the economy.

By implementing study programs that cover topics such as waste management, environmental protection, water protection, geotechnics, green energy, decarbonization, and the circular economy, the Faculty opens the door to so-called green jobs. These aim to fill the labour market gap with experts qualified to solve engineering problems in environmental protection in line with professional standards, while simultaneously respecting ethical principles and legal regulations in the field of environmental protection. Through scientific research, combined with the rational use of human and material resources, the Faculty seeks to ensure the mobility of teachers/researchers and students, as well as the continuous improvement of overall quality. By transferring knowledge and technologies acquired through scientific research into the economic sector, the Faculty contributes to the economic prosperity of society. Through professional activities (preparation of studies, reports, projects, etc.), a strong interaction between theory and practice is achieved, ultimately resulting in engineering solutions aimed at improving the quality of individual environmental components and contributing to the economy in the field of environmental protection. In this way, the Faculty strengthens its ties with the region and actively engages in the life and problem-solving of the local community.

VISION

The Faculty of Geotechnical Engineering seeks to establish itself at the national level as a leading higher education and research institution specialized in higher education, scientific, and professional work in the field of environmental engineering, particularly in those segments focused on the identification, design, construction, and management of systems aimed at solving environmental protection problems. These problems relate to soil, water, and air pollution, waste management issues, and the definition of environmental protection mechanisms. The Faculty aims to become an internationally recognized institution actively involved in the European Research Area and in student and researcher mobility programs.

VALUES

Through the Development Strategy of the Faculty of Geotechnical Engineering, the values of the Faculty have been highlighted as follows:

- tradition of teaching, scientific, and professional work in the fields of geoengineering, water management, and environmental management,
- interdisciplinarity of researchers and a predominantly in-house staff base,
- good equipment of the Faculty for teaching and scientific research activities,
- doctoral program and high-quality mentors,
- excellent scientific productivity,
- many doctoral students employed through projects,
- implementation of scientific and professional projects,
- student internships at undergraduate and graduate levels,
- environmental topics, which form the basis of the study program, becoming a prerequisite for the economic development of the EU and the Republic of Croatia,
- advisory involvement of international experts through the International Scientific Advisory Board,
- experience in implementing projects funded by EU funds.

1.4. Study Programs of the Faculty of Geotechnical Engineering

The Faculty of Geotechnical Engineering (GFV) is a public higher education institution within the University of Zagreb (UNIZG). It organizes and delivers university and professional study programs (undergraduate, graduate, and postgraduate) in the scientific field of technical sciences, within the area of interdisciplinary technical sciences, civil engineering, and other related fields. It also conducts scientific and highly professional work in the fields of technical, natural, and interdisciplinary sciences

At the Faculty of Geotechnical Engineering, university study programs in Environmental Engineering are conducted at three levels of higher education:

- Undergraduate university study program in Environmental Engineering (introduced in 2012),
- Graduate university study program in Environmental Engineering (introduced in 2015),
- Postgraduate doctoral study program in Environmental Engineering (introduced in 2018).

In the academic year 2012/2013, the first cohort of 120 students enrolled in the **undergraduate university study program Environmental Engineering**. The program has no specializations and lasts three years. During their studies, students acquire knowledge in the fundamental natural and technical sciences, which serve as a prerequisite for understanding the basic principles of environmental engineering.

Table 1. University Undergraduate and Graduate Study Programs in Environmental Engineering

UNIVERSITY UNDERGRADUATE STUDY OF ENVIRONMENTAL ENGINEERING	UNIVERSITY GRADUATE STUDY OF ENVIRONMENTAL ENGINEERING
- **Professional or Academic title acquired upon completion of the Study:** Bachelor of Science (baccalaureus/baccalaurea) Environmental Engineer (univ. bacc. ing. amb.) - **Type of Study:** University Study - **Area and field:** Area of Technical Sciences, Field 2.16. Interdisciplinary Technical Sciences - **Study Holder:** University of Zagreb Faculty of Geotechnical Engineering - **Name of the implementer:** University of Zagreb Faculty of Geotechnical Engineering - **Period of university education:** VI semester (3 years) - **ECTS credits:** 180 - **Method of implementation:** full-time and part-time study - **Location:** Varaždin - **Year of accreditation of the study programme:** The decision on the acceptance of the study programme was made by the Senate of the University of Zagreb on 19 January 2012, and on 16 February 2012 the Ministry of Science, Education and Sports entered the study programme in the Register of Study Programmes.	- **Professional or Academic title acquired upon completion of the Study:** Master of Science in Environmental Engineering – (mag.ing.amb.) - **Type of Study:** University Study - **Level of Study:** Graduate Level - **Area and field:** Area of Technical Sciences, Field 2.16 Interdisciplinary Technical Sciences - **Study Holder:** University of Zagreb Faculty of Geotechnical Engineering - **Name of the implementer:** University of Zagreb Faculty of Geotechnical Engineering - **Period of university education:** IV semester (2 years) - **ECTS credits:** 120 - **Method of implementation:** full-time and part-time study - **Location:** Varaždin - **Year of accreditation of the study programme:** The decision on the acceptance of the study programme was made by the Senate of the University of Zagreb on 19 May 2015. On July 14, 2015, the Ministry of Science, Education and Sports entered the study program in the Register of Study Programs.

The graduate university study program Environmental Engineering lasts two years and is conducted in three specializations: *Environmental Geoengineering, Water Management, and Environmental Management.*

- *Environmental Geoengineering* enables participation in planning, designing, organizing, and executing tasks on projects and studies related to conservation, monitoring, protection, and remediation of the environment, assessment of environmental impacts of planned interventions, field investigations for environmental and geotechnical purposes, as well as professional work in civil engineering and mining.
- *Water Management* addresses issues of water resources, giving equal importance to the quantity and quality of drinking water, wastewater issues, their disposal and remediation, the complex area of energy utilization of water resources, as well as land reclamation systems and watercourse regulation.
- *Environmental Management* is an interdisciplinary specialization that encompasses an engineering approach to identifying, preventing, and mitigating adverse environmental impacts. The broad knowledge base acquired through this specialization enables solving a range of environmental challenges such as waste management, energy transition, soil

remediation, life cycle assessment, environmental impact assessment, and environmental inspection.

In March 2004, the University of Zagreb launched the **interdisciplinary postgraduate specialist study Ecoengineering** through an Agreement on the Establishment of the Program signed by 13 constituent units of the University of Zagreb. The Faculty of Geotechnical Engineering was one of the founding faculties. Since then, this program has been offered as a university specialist study, with GFV professors continuously participating in teaching, mentoring, evaluation of final papers, and in the work of the study's professional council

Long-standing efforts by faculty members in developing the Faculty as a higher education institution culminated on 10 July 2018, when the University Senate approved the **postgraduate doctoral study program Environmental Engineering**. The program's structure consists of one required course (5 ECTS), one elective course chosen from nine program level courses (4 ECTS), and four courses selected from one of five modules (4 x 5 ECTS). These modules are:

- Sustainable Waste Management (8 courses offered),
- Environment and Nature (7 courses offered),
- Environmental Geoengineering (7 courses offered),
- Water Management (9 courses offered),
- Energetics (6 courses offered).

To facilitate recognition of their research interests, doctoral candidates may independently select the structure of the coursework from courses offered across all modules. In this way, candidates are given wide flexibility to, in addition to the compulsory and one elective course at the program level, choose four courses from different modules as desired. Teaching is delivered not only by GFV faculty but also by a significant number of distinguished scientists from the fields of social, natural, and technical sciences.

1.5. Previous Re-accreditation Procedures of the Faculty of Geotechnical Engineering

RE-ACCREDITATION IN 2012

During the re-accreditation process of higher education institutions in the academic year 2011/2012, the Faculty of Geotechnical Engineering was also evaluated. An international expert panel of five members, appointed by the Accreditation Council of the Agency for Science and Higher Education, visited the Faculty on 26 March 2012 and prepared a report on the conducted evaluation.

During re-accreditation, the expert panel identified certain strengths and weaknesses of the Faculty. The summarized recommendations for quality enhancement at that time emphasized:

- that the Faculty of Geotechnical Engineering was undergoing a long period of very significant changes, as the two-cycle study system had been introduced in 2005, followed by adjustments in study programs to meet labour market needs, the necessity of increased internationalization due to Croatia's accession to the European Union, and due to overlaps with other study programs and the unfavourable organization of courses in the first semesters

- that the introduction of a quality assurance system at that time required the formalization of processes and procedures, as well as a reconsideration of the institution's governance approach
- that these changes demanded considerable effort, and many of them had not yet been completed but were still in progress or had just begun, with many modifications ongoing or yet to be implemented. The panel noted that the real challenge was to set clear priorities and manage all the initiated activities effectively.

Following the expert panel's visit, the 2011 Self-Analysis prepared by the Faculty of Geotechnical Engineering, and other documentation, the panel compiled the Final Report and concluded that the Faculty was heading in the right direction, likely toward the establishment of a new Faculty of Environmental Engineering, and that Croatia needed, and would likely continue to need, this type of program in the future. They also emphasized the importance of the Faculty's location in Varaždin, as it represents a suitable setting for students from northwestern Croatia, who would continue to make up most of the Faculty's student population, even as it attracts students from other regions or abroad

➢ **CONFIRMATION OF FULFILLMENT OF CONDITIONS FOR PERFORMING ACTIVITIES**

The Ministry of Science, Education and Sports, by Confirmation dated 25 January 2013, confirmed,

on the basis of Article 22, Paragraph 4 of the Act on Quality Assurance in Science and Higher Education (OG 45/2009), and following the positive accreditation recommendation of the Agency for Science and Higher Education of 7 January 2013 (Class: 602-04/12-04/0007, Reg. No.: 355-02-04-13-2) issued in the re-accreditation procedure of the Faculty of Geotechnical Engineering, and with the prior opinion of the Accreditation Council of the Agency for Science and Higher Education, that

the Faculty of Geotechnical Engineering of the University of Zagreb meets the conditions for conducting higher education and scientific activities as defined by the provisions of the Act on Quality Assurance in Science and Higher Education (OG 45/2009), the Ordinance on the Content of the Licence and Conditions for Granting the Licence for Carrying Out Higher Education Activities, Delivery of Study Programmes and Re-accreditation of Higher Education Institutions (OG 24/10), the Ordinance on the Conditions for Granting the Licence for Carrying Out Scientific Activities, Conditions for Re-accreditation of Scientific Organizations and the Content of the Licence (OG 83/10), and the Criteria for Evaluating the Quality of Higher Education Institutions within Universities of the Agency for Science and Higher Education, dated 29 June 2011 (Class: 003-08/11-02/0005, Reg. No.: 355-02-04-11-8).

On the basis of the issued Confirmation, the Agency for Science and Higher Education also determined the necessity of implementing a post-monitoring program of the Faculty's activities, which included the following steps:

- adoption and submission of a Strategic Scientific Research Programme for a period of at least five years in the scientific field of the Faculty's activities, within one year from the date of delivery of the confirmation
- adoption and submission of an Action Plan within six months from the date of delivery of this confirmation to determine the improvement of quality in the performance of higher education activities
- annual reporting on the implementation of the Action Plan, including updating of implementation conditions in the Agency's information system – MOZVAG.

➢ **POST-MONITORING PROGRAMME FOR THE PERIOD 2013 – 2018**

As part of the prescribed monitoring programme, the Faculty of Geotechnical Engineering undertook the following actions during this period:

- in July 2013 submitted to ASHE the Strategic Programme of Scientific Research for the period 2012–2016 and the Action Plan for Quality Improvement for the academic year 2012/2013
- updated the MOZVAG database according to the Teaching Implementation Plan of the Faculty of Geotechnical Engineering for the academic year 2015/2016, adopted at the session of the Faculty Council in the academic year 2014/2015, held on 23 September 2015
- adopted the Report on the Implementation of the Action Plan for Quality Improvement for the academic year 2012/2013 at the session of the Faculty Council in the academic year 2013/2014, held on 20 November 2013, and submitted it to the University of Zagreb Quality Management Office (URKVA)
- adopted the Action Plan for Quality Improvement for the academic year 2013/2014 at the session of the Faculty Council in the academic year 2013/2014, held on 20 November 2013, and submitted it to the University of Zagreb Quality Management Office (URKVA)
- adopted the Report on the Implementation of the Action Plan for Quality Improvement for the academic year 2013/2014 at the session of the Faculty Council in the academic year 2014/2015, held on 26 November 2014, and submitted it to the University of Zagreb Quality Management Office (URKVA)
- adopted the Action Plan for Quality Improvement for the academic year 2014/2015 at the session of the Faculty Council in the academic year 2014/2015, held on 26 November 2014, and submitted it to the University of Zagreb Quality Management Office (URKVA)
- adopted the Report on the Implementation of the Action Plan for Quality Improvement for the academic year 2014/2015 at the session of the Faculty Council in the academic year 2015/2016, held on 18 November 2015, and submitted it to the University of Zagreb Quality Management Office (URKVA)
- adopted the Action Plan for Quality Improvement for the academic year 2015/2016 at the session of the Faculty Council in the academic year 2015/2016, held on 18 November 2015, and submitted it to the University of Zagreb Quality Management Office (URKVA).

SELF-ASSESSMENT OF THE DEVELOPMENT OF THE QUALITY ASSURANCE SYSTEM IN 2016

In the period from March to April 2016, a Self-Assessment of the development of the quality assurance system was carried out at all constituent units of the University of Zagreb, as part of the internal audit procedure conducted by the University of Zagreb Quality Management Committee.

Following the submission of the Self-Assessment, which was prepared by the Faculty of Geotechnical Engineering Quality Management Committee in cooperation with the Management, teaching staff, and administrative services, representatives of the University of Zagreb Quality Management Committee, Assoc. Prof. Danijela Ašperger, PhD (Faculty of Chemical Engineering and Technology, University of Zagreb) and Prof. Marina Cindrić, PhD (Faculty of Science, University of Zagreb), visited the Faculty of Geotechnical Engineering on 25 April 2016 and conducted the field part of the Internal Audit procedure, after which a Report of the Quality Management Committee was prepared.

As part of the internal audit of the quality assurance system at the University of Zagreb, the Committee held an informational discussion with members of the Faculty of Geotechnical Engineering Quality Management Committee, the Vice-Dean for Education and Quality Management, and the Vice-Dean for Science and International Cooperation.

Since the purpose of the internal audit of the quality assurance system at the University of Zagreb – for which a Final Report was prepared – was not to deliver a concrete evaluation of the quality assurance system for individual constituents (including the Faculty of Geotechnical Engineering), such an assessment was never provided. Nevertheless, based on the discussion held and the fact that the University of Zagreb Internal Audit Committee accepted the submitted self-assessment form of the development of the quality assurance system at the Faculty of Geotechnical Engineering, and during the site visit increased the overall assessment, the general impression was that the quality assurance system at the Faculty of Geotechnical Engineering at that time was at a satisfactory level.

RE-ACCREDITATION IN 2018

During 2018, the second re-accreditation procedure of the Faculty of Geotechnical Engineering was conducted, in accordance with the Re-accreditation Plan for Higher Education Institutions in 2018 adopted by the Accreditation Council of the Agency for Science and Higher Education (ASHE). In compliance with ASHE's requirements, all necessary data were entered into MOZVAG, and the Self-Assessment of the Faculty of Geotechnical Engineering was prepared before the set deadline, i.e., by 4 May 2018. The Agency for Science and Higher Education carried out the re-accreditation procedure of the evaluated higher education institution in line with its general act

The Accreditation Council of the Agency for Science and Higher Education adopted, on 25 April 2018, the Decision on the Appointment of the Expert Panel for the Re-accreditation of the Faculty of Geotechnical Engineering.

The Expert Panel visited the Faculty on 5 and 6 June 2018 and, during the visit, held a series of meetings with various stakeholders (management, the working group that prepared the self-assessment, students, alumni, heads of departments, teachers, assistants, project leaders, representatives of the business sector, and potential employers). Based on the Self-Assessment of the Faculty of Geotechnical Engineering (2018), prepared by the Faculty, and the observations made during the visit, they prepared the Final Re-accreditation Report, which was delivered to the Faculty of Geotechnical Engineering on 19 September 2018.

Due to strong disagreement with the Expert Panel's Report, the Faculty of Geotechnical Engineering prepared a document entitled Response of the Faculty of Geotechnical Engineering to the Final Report of the Expert Panel in the Re-accreditation Procedure and submitted it to the Agency for Science and Higher Education on 3 October 2018. In the subsequent documents sent to the Faculty of Geotechnical Engineering by the Agency for Science and Higher Education or the Ministry of Science and Education, no comments were made regarding the Faculty's response.

The Agency for Science and Higher Education, with the prior Opinion of the Accreditation Council, adopted on 26 November 2018 an Accreditation Recommendation, advising the Minister responsible for science and higher education to issue a Letter of Expectation with a three-year deadline for

addressing the identified deficiencies in the activities of higher education and scientific research at the Faculty of Geotechnical Engineering

On 6 February 2020, based on the Accreditation Recommendation, the Ministry of Science and Education issued a Letter of Expectation with a three-year deadline for addressing the identified deficiencies in performing higher education and scientific research activities, stipulating that the Faculty of Geotechnical Engineering must prepare an Action Plan for eliminating the deficiencies identified in the re-accreditation process and submit it to the Agency for Science and Higher Education within six months.

- **ACTION PLAN FOR THE PERIOD 2020 – 2022**

In the Action Plan for Quality Improvement within the second cycle of re-accreditation of the Faculty of Geotechnical Engineering, the recommendations of the Expert Panel were listed for each standard within the thematic areas that had been evaluated with an unsatisfactory or minimal level of quality, giving priority to activities rated as unsatisfactory, without reference to the subsequently submitted comments of the Faculty of Geotechnical Engineering.

The Action Plan of the Faculty of Geotechnical Engineering, related to the Letter of Expectation issued by the Ministry of Science and Education, was adopted at the session of the Faculty Council in the academic year 2019/2020, held on 16 September 2020 (Class: 602-04/18-13/00168, Reg. No.: 533-04-20-0004)

The Agency for Science and Higher Education requested a supplement to the Action Plan, in accordance with the Opinion of the Accreditation Council (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-20-0017, 23 October 2020). The Supplement to the Action Plan of the Faculty of Geotechnical Engineering was prepared and adopted at the Faculty Council session in the academic year 2020/2021, held on 25 November 2020.

On 28 December 2020, the Agency for Science and Higher Education adopted the Action Plan of the Faculty of Geotechnical Engineering aimed at eliminating deficiencies outlined in the Letter of Expectation, based on the Opinion of the Accreditation Council on the submitted Supplement to the Action Plan (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-20-0019).

The first annual Report on the Implementation of the Action Plan for Quality Improvement in the second cycle of re-accreditation, covering the period from February 2020 to February 2021, was adopted at the Faculty Council session in the academic year 2020/2021, held on 17 March 2021, and subsequently by the Accreditation Council of the Agency for Science and Higher Education (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-21-0021, 28 April 2021). The second annual Report on the Implementation of the Action Plan for Quality Improvement in the second cycle of re-accreditation, covering the period from February 2021 to February 2022, was adopted at the Faculty Council session in the academic year 2021/2022, held on 16 March 2022, and subsequently by the Accreditation Council of the Agency for Science and Higher Education (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-22-0023, 28 April 2022)

The Final Report on the Implementation of the Action Plan for Quality Improvement in the second cycle of re-accreditation, covering the period from February 2020 to November 2022, was adopted at

the Faculty Council session in the academic year 2022/2023, held on 26 October 2022 (Class: 602-04/18-02/01, Reg. No.: 2186-73-04-22-25), and was subsequently adopted by the Accreditation Council of the Agency for Science and Higher Education (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-22-0025, 9 December 2022).

- **CONFIRMATION OF FULFILLMENT OF CONDITIONS FOR CARRYING OUT ACTIVITIES**

By the Confirmation (Class: 602-04/18-13/00168, Reg. No.: 533-04-23-0007) of 30 January 2023, the Ministry of Science and Education confirms,

on the basis of Article 49 of the Act on Quality Assurance in Higher Education and Science (OG 151/22) and following the positive Accreditation Recommendation of the Agency for Science and Higher Education of 9 January 2023 (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-23-0026), issued on the basis of the opinion of the Accreditation Council of the Agency for Science and Higher Education in the re-accreditation procedure conducted in 2018, that

the Faculty of Geotechnical Engineering, University of Zagreb, fulfils the conditions for carrying out higher education and scientific activities as stipulated by the Act on Quality Assurance in Science and Higher Education (OG 45/09), the Regulation on the Content of the Licence and Conditions for Issuing a Licence for Carrying Out Higher Education Activities, Implementation of Study Programmes and Re-accreditation of Higher Education Institutions (OG 24/10), the Regulation on Conditions for Issuing a Licence for Carrying Out Scientific Activities, Conditions for Re-accreditation of Scientific Organisations and Content of the Licence (OG 83/10), the document Re-accreditation Procedure of Higher Education Institutions (Class: 602-04/18-04/0025, Reg. No.: 355-02-04-19-0004, dated 17 July 2019), and the document Standards for Assessing the Quality of Universities and University Constituents in the Re-accreditation Procedure of Higher Education Institutions of the Agency for Science and Higher Education.

- **FIVE-YEAR ACTION PLAN OF ACTIVITIES FOR THE PERIOD 2023 – 2027**

Upon receipt of the Confirmation from the Ministry of Science and Education and Youth on the fulfilment of conditions for carrying out higher education and scientific activities, the Faculty of Geotechnical Engineering was obliged to:

- within six months from the date of delivery of the Confirmation, adopt a five-year Action Plan aimed at quality improvement, in accordance with the recommendations of the Expert Panel contained in the Final Report of the Expert Panel, and deliver it to the Agency;
- two years after adopting the Action Plan, report to the Agency on its implementation and, in line with the implementation, update the conditions of delivery in the Agency's information system.

In accordance with the issued Confirmation of the Ministry of Science and Education, the Faculty of Geotechnical Engineering prepared the Five-Year Action Plan of Activities. The Five-Year Action Plan was prepared in accordance with the recommendations of the Expert Panel contained in the Final Report and aligned with the guidelines of the Office for Quality Management of the University of Zagreb (URKVA) and with the Development Strategy of the Faculty of Geotechnical Engineering for the period 2022 – 2027.

The Five-Year Action Plan of the Faculty of Geotechnical Engineering was adopted at the session of the Faculty Council in the academic year 2022/2023, held on 5 July 2023, and was subsequently accepted without the need for further amendments by the Accreditation Council of the Agency for Science and Higher Education (Class: 602-04/17-04/0063, Reg. No.: 355-02-04-22-0025, 9 December 2022).

The Accreditation Council also issued additional recommendations, among which the following stand out:

- the number of published scientific papers in the WoS database and the number of submitted projects should not necessarily be the only indicators – consider internal/institutional incentives
- articulate more clearly the activities and indicators related to preventing high dropout rates
- emphasize the role and necessity of establishing an International Advisory Board with prominent international experts

1.6. Description of the Process of Drafting the Self-Evaluation Report of the Faculty of Geotechnical Engineering

18 October 2024 – The Agency for Science and Higher Education published on its website the *Plan of Re-accreditation of Higher Education Institutions for 2025* (Class: 602-04/24-04/28, Reg. No.: 355-02-04-24-02), which included the University of Zagreb Faculty of Geotechnical Engineering.

23 October 2024 – At the 1st regular session of the Faculty Council of the Faculty of Geotechnical Engineering in the academic year 2024/2025, a Decision was adopted on the appointment of the Chair and members of the Quality Management Committee of the Faculty of Geotechnical Engineering for a three-year term.

11 December 2024 – At the 3rd regular session of the Faculty Council of the Faculty of Geotechnical Engineering in the academic year 2024/2025, a Decision was adopted on the appointment of the Working Group for drafting the Self-Evaluation Report in the re-accreditation procedure of the Faculty of Geotechnical Engineering in 2025.

27 February 2025 – The Dean, Assoc. Prof. Ivana Grčić, PhD, convened the initial meeting of the Working Group for drafting the Self-Evaluation Report in the re-accreditation procedure of the Faculty of Geotechnical Engineering in 2025. At the meeting, the Chair of the Faculty Quality Assurance Committee, Prof. Ranko Biondić, PhD, presented the initial content of the Self-Evaluation Report, the themes covered in the document, as well as the elements and indicators within each quality standard.

3 April 2025 – A workshop for CROSBI module editors was held at the Ruđer Bošković Institute, attended by Ivančica Rosner, the CROSBI module editor at the Faculty of Geotechnical Engineering.

6 May 2025 – A training session for drafting the Self-Evaluation Report was held at the Antunović Hotel, organized by the Agency for Science and Higher Education (ASHE), attended by Prof. Ranko Biondić, PhD, Prof. Hrvoje Meaški, PhD, and Assoc. Prof. Jelena Loborec, PhD.

12 May 2025 – A training session for data entry was held in Zagreb, organized by the Agency for Science and Higher Education (ASHE) and the University Computing Centre (SRCE), attended by Prof.

Ranko Biondić, PhD, Assoc. Prof. Jelena Loborec, PhD, Denis Težak, PhD, and Ivančica Rosner, Head Librarian.

16 May 2025 – A decision on the appointment of the institutional editor for the ISPiK application was adopted and submitted to ASHE.

18 May 2025 – Work on drafting the Self-Evaluation Report commenced by assigning tasks within the narrower Working Group for drafting the document in the re-accreditation procedure of the Faculty of Geotechnical Engineering in 2025, distributed as follows:

- Vice-Dean for Management – Prof. Hrvoje Meaški, PhD – Theme I; 4.6.
- Vice-Dean for Education – Assoc. Prof. Jelena Loborec, PhD – Theme II; Theme III (except 3.5.); Theme IV (except 4.6)
- Vice-Dean for Science – Prof. Nikola Sakač, PhD – Theme V; 3.5.

25 June 2025 – A request was submitted to ASHE for a change in the evaluation year from the academic year 2024/2025 to the academic year 2023/2024, as it would not be possible at the time of submission of the Self-Evaluation Report to prepare all the necessary analytical annexes for the ongoing academic year, which would not yet have concluded.

2 July 2025 – At the extended session of the Dean's Collegium, the Draft Self-Evaluation Report was presented to members of the Dean's Collegium in extended composition.

9 July 2025 – At the Faculty Council, the Draft Self-Evaluation Report was presented to members of the Faculty Council.

23 July 2025 – At the Faculty Council, the final version of the Self-Evaluation Report was presented and referred to the formal reading procedure.

27 August 2025 – At the extended session of the Dean's Collegium, the final version of the Self-Evaluation Report was presented for adoption at the Faculty Council.

1 September 2025 – The Self-Evaluation Report was adopted at the 17th extraordinary session of the Faculty Council in the academic year 2024/2025.

2. SELF-ANALYSIS

I. GOVERNANCE OF THE HIGHER EDUCATION INSTITUTION AND QUALITY ASSURANCE

1.1 The Mission of the Higher Education Institution Directs the Process of Operational Planning and the Development of Quality Assurance Processes

The higher education institution has a publicly available, contemporary mission which, together with its defined values and objectives, provides the framework and direction for its activities.
The mission clearly defines the specific role of the institution in carrying out higher education, scientific and professional activities, as well as in contributing to the development of modern society. The mission positions the institution within the national and international context, guiding the development of study programs, educational programs, and all institutional activities.
Representatives of different stakeholder groups are involved in the development and definition of the institution's mission.
The mission statement serves as the starting point for the strategic planning process and the formulation of strategic objectives.

WORK IN ACCORDANCE WITH THE MISSION

The Faculty of Geotechnical Engineering operates in line with its mission and vision, as stipulated in Article 6 of the Statute of the Faculty of Geotechnical Engineering (2023). The mission and vision take into account the specific characteristics of the Faculty and align its development with the mission and vision of the University of Zagreb.

The current **mission** and **vision** of the Faculty of Geotechnical Engineering are defined in the Development Strategy of the Faculty of Geotechnical Engineering of the University of Zagreb for the period 2023–2027 and the Scientific Research Strategy of the Faculty of Geotechnical Engineering for the period 2023–2027. Both strategic documents are publicly available on the official website of the Faculty of Geotechnical Engineering.

- **DEVELOPMENT MISSION**

The mission of the Faculty of Geotechnical Engineering is to conduct scientific research and deliver research-based higher education in the interdisciplinary field of environmental engineering, as well as to transfer and apply knowledge to the economy.

By offering study programs that cover topics such as waste management, environmental protection, water protection, geotechnics, green energy, decarbonisation, and the circular economy, the Faculty opens doors to the field of so-called green jobs, aiming to fill the gap in the labour market for professionals qualified to solve engineering problems in environmental protection in accordance with professional standards, while simultaneously respecting ethical principles and legal regulations in the field of environmental protection.

Through scientific research, and with the rational use of human and material resources, the Faculty seeks to ensure the mobility of teachers/researchers and students, and the continuous growth of overall quality. By transferring knowledge and technologies gained through research into the economic sector, the Faculty contributes to the economic prosperity of society.

Through professional work (the preparation of expert reports, studies, projects, etc.), strong interaction between theory and practice is achieved, ultimately resulting in engineering solutions aimed at improving the quality of environmental components and supporting the economy in the field of environmental protection. In this way, the Faculty strengthens its ties with the region and is actively engaged in addressing local community challenges.

- **SCIENTIFIC MISSION**

The scientific mission of the Faculty of Geotechnical Engineering is to conduct research in the field of technical sciences: interdisciplinary technical sciences (environmental engineering), civil engineering (geotechnics and hydraulics), mining, petroleum and geological engineering, chemical engineering, geodesy, and mechanical engineering, as well as in the natural sciences (mathematics, chemistry, physics, biology, geophysics).

The Faculty provides an interdisciplinary human and material base for scientific research, collaborates with related domestic and international scientific institutions, publishes research results in relevant scientific journals, and ensures the transfer and application of research results in the economy and public life. It establishes and implements scientific and development projects, and scientific and professional activities in technical, natural, and interdisciplinary sciences, with recognised expertise in waste management, geotechnical, geochemical, hydrogeological, and hydrological research, analyses and modelling, decarbonisation, and the application of catalytic techniques for solving water and air pollution problems.

The research profile of the Faculty of Geotechnical Engineering has been developed in accordance with its mission and vision, as well as its aspiration to be recognised as an institution offering relevant education in the STEM field. The research profile has been prepared exclusively in English, precisely due to the need to increase international visibility.

The research profile encompasses the main research topics, areas with substantial scientific and professional expertise, clearly demonstrated knowledge transfer, and, ultimately, areas identified as crucial for future development in which capacity building is continuously pursued.

STRATEGIC DOCUMENTS

- **DEVELOPMENT STRATEGY**

The Development Strategy of the Faculty of Geotechnical Engineering was adopted at the session of the Faculty Council in the academic year 2022/2023, held on 20 January 2023. The strategy defines the Faculty's development period from 2023 to 2027, considering its specific features and aligning its development with the Development Strategy of the University of Zagreb. This strategy continues the previous Development Strategy covering the period 2018–2022 and extends the implementation of certain strategic goals that were not fully realised or require a longer implementation period than a single strategic cycle. It also follows on from the Development Strategy of the Faculty of Geotechnical Engineering for 2013–2018.

The key documents used to prepare the 2023–2027 Development Strategy included: **the Analysis of the implementation of the 2018–2022 Development Strategy, long-term Plans of individual departments for the period 2023–2027,** and various documents underpinning the Faculty's teaching, research, professional development, and quality assurance activities and objectives. The Development Strategy also draws upon an updated SWOT analysis prepared in anticipation of the new strategy.

In addition to the mission and vision, the Development Strategy sets out the general strategic development objectives and a series of specific goals in the Faculty's key areas of activity: teaching, research, professional development, and quality assurance. These domains also reflect the Faculty's internal organisation, ensuring smoother implementation of objectives.

The three overall strategic objectives are: (1) securing employability of graduates in the labour market, (2) changing the Faculty's name to ensure clear recognition in the interdisciplinary technical field related to environmental engineering, and (3) increasing the Faculty's visibility and its study programmes by promoting environmental engineering.

The draft Development Strategy was prepared by a Working Group comprising: the Dean (responsible for general strategic goals and alignment of specific objectives), the Vice Dean for Education (teaching-related goals), the Vice Dean for Science and International Cooperation (research-related goals), the Vice Dean for Management (professional development goals), and the Faculty's Quality Management Committee (quality assurance goals and ESG alignment). Department Heads were responsible for aligning their departments' long-term plans with the final draft strategy. Heads of administrative units ensured the alignment of their respective areas (Faculty Secretary for legal matters and governance, Head of Accounting for professional/business operations, and Head of the Library for library services).

Students and external stakeholders were involved through Faculty committees where they are represented, contributing to consensus-building and drafting, as well as directly through their representatives in the Faculty Council.

- **SCIENTIFIC RESEARCH STRATEGY**

The Scientific Research Strategy of the Faculty of Geotechnical Engineering for 2023–2027 was adopted at the Faculty Council session in the academic year 2022/2023, held on 14 December 2022. In addition to the scientific mission and vision, the strategy defines the Faculty's research profile (GFV-ID), one general objective, and seven specific goals for the development of research. The general objective is to maintain productivity while increasing the quality of research and to achieve national and international recognition and reputation of the Faculty as a research institution.

The first Scientific Research Strategy of the Faculty (2012–2016) was adopted in 2012, followed by a 2017 Research Activity Plan. For both, an evaluation of achievements was carried out. The next Scientific Research Strategy (2018–2022) clearly defined objectives and measurable indicators.

The 2023–2027 strategy was built on the previous strategy and an analysis of achieved goals. Given the significant growth of research capacity and productivity, new goals were set with more indicators, with a focus on international recognition of the Faculty's research. Most of the goals are long-term in nature, with a central emphasis on positioning and affirming environmental engineering research, which naturally connects the Faculty's traditional research activities and ambitions with new internationalisation priorities.

The strategy also relies on a newly prepared Scientific Research SWOT analysis of the Faculty's research potential, serving as the basis for setting strategic objectives and related activities.

The draft strategy was prepared by the Faculty's Research Committee, with guidance from the International Scientific Advisory Board (ISAB-GFV).

- **STRATEGIC DOCUMENT ADOPTION PROCEDUR**

The procedure for adopting strategic documents is defined by the Dean's instructions regarding the preparation of new strategies. The first formal meeting of the Working Group for the Development Strategy was held in October 2022.

The Dean's instructions for finalising the 2023–2027 strategic documents specified the procedure leading up to their adoption.

Drafts of both strategies were presented at the Faculty Council session on 23 November 2022. Prior to that, they were presented at the extended Dean's Board on 16 November 2022. The draft Scientific Research Strategy had been formally approved by the Research Committee, while the Development Strategy draft was subsequently supplemented with additional data on objectives, tasks, and indicators.

Drafts were made available to all members of the Faculty Council from 23 November 2022, allowing internal consultation. Comments and suggestions were accepted up until one day before the extended Dean's Board session in December 2022, ensuring the final versions were completed in time for Council adoption.

Accordingly, the definition of the Faculty's mission and vision, as well as the final content of both strategic documents, involved all Faculty Council members, either directly or through elected representatives of various employee categories and students

DEVELOPMENT OF THE QUALITY ASSURANCE SYSTEM

The Faculty of Geotechnical Engineering operates in all its segments in accordance with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), while respecting the provisions of the Act on Quality Assurance in Higher Education and Science and the Quality Assurance Policy of the University of Zagreb.

The Dean and the Faculty Council are responsible for the quality assurance system at the Faculty of Geotechnical Engineering, while at the operational level this responsibility lies with the Quality Assurance Committee of the Faculty, appointed by the Faculty Council on the Dean's proposal.

The Quality Assurance Committee at the Faculty of Geotechnical Engineering operates with the aim of preserving the effective process of all activities within the quality assurance system (4P): planning – implementation – verification – proposal for changes:

- **Planning activities**: preparing the Annual Activity Plan in accordance with ESG, considering the defined activities carried out at the Faculty and the requirements of individual departments
- **Implementation of planned activities**; in accordance with the adopted Annual Activity Plan;

- **Verification of implemented activities**; to determine the effectiveness of the planned activity, with the preparation of a short formal report and analysis of the implementation of individual activities, if necessary.
- **Proposing changes**; based on the collected and analysed results and the assessment of the effectiveness of the implementation of planned activities, if deemed necessary.

Continuous monitoring and improvement of the quality assurance system includes:

- **Revision of quality assurance documents**; periodic harmonization of the Ordinance and Handbook on Quality Assurance at the Faculty level, in line with the requirements of the University of Zagreb and the Agency for Science and Higher Education (ASHE)
- **Preparation of a SWOT analysis**; analysis of strengths, weaknesses, opportunities, and threats related to the achievement of the Faculty's objectives, based on partial analyses by individual departments
- **Implementation of internal and/or external audits of the quality assurance system**; defining the audit procedure to enable verification of its effectiveness at all levels and areas of activity. External independent audits of the quality assurance system are conducted in accordance with the guidelines of ASHE or the University of Zagreb Quality Management Office
- **Implementation of re-accreditation**; coordination of the re-accreditation procedure of the Faculty. During institutional re-accreditation, a series of procedures must be carried out across the entire Faculty, in line with ASHE requirements and within the prescribed deadlines, necessary for the successful implementation of the process
- **Preparation of a self-analysis**; to ensure the effectiveness of the implemented quality assurance system, it is necessary to prepare, coordinate, and document the required self-analysis of the Faculty.

1.2 The higher education institution has defined the internal structure and processes that are responsibly, efficiently and effectively managed, and the stakeholders of the higher education institution are involved in the decision-making processes

The governance of a higher education institution is based on the academic self-government of higher education institutions and the autonomy of universities.
The autonomy of universities includes the regulation of internal organization and management in accordance with the Act on Higher Education and Scientific Activity and subsidiary laws and regulations; the establishment of educational, scientific and professional programmes; deciding on the acceptance of projects and international cooperation; financial autonomy as part of the program agreement and responsibility towards the community.
Using the quality assurance system and available information systems, the higher education institution collects data, processes it, analyses it and creates reports using various methods. Based on the results of the analyses, further activities and improvements are planned to use a risk- and opportunity-based approach. The administration and the competent authorities take well-founded decisions. Students and other stakeholders are involved in these processes.
The higher education institution shall regularly and transparently report on the implementation of the strategy, operations and the implementation of programme agreements, where applicable.
The higher education institution manages financial resources transparently, efficiently, purposefully and sustainably.

UNIVERSITY AUTONOMY

University autonomy and self-governance are fundamental values of the University of Zagreb, as defined in Article 1 of the Statute of the University of Zagreb (2023) and Article 2 of the Statute of the Faculty of Geotechnical Engineering (2023). In line with this, the Faculty safeguards, exercises, and promotes university autonomy and self-governance, and is permanently committed to them. It is prohibited to abolish, restrict, diminish, or relativize university autonomy and self-governance, or to undertake any actions that would undermine them. The Statutes and other acts of the University of Zagreb and the Faculty are interpreted while respecting and promoting university autonomy and self-governance

- **SELF-GOVERNANCE**

The management of the Faculty of Geotechnical Engineering is based on the principle of academic self-governance of higher education institutions and on the autonomy of the University of Zagreb. Accordingly, the Faculty of Geotechnical Engineering is an independent constituent unit of the University of Zagreb, holding legal personality, registered in the Commercial Court Register in Varaždin, in the Register of Scientific Organizations, and in the Register of Higher Education Institutions.

The Faculty operates in accordance with the provisions of its Statute, which was revised and adopted at the Faculty Council meeting of 10 May 2023, to align with the Act on Higher Education and Scientific Activity (OG 119/2022) and the new Statute of the University of Zagreb (2023).

The Faculty also operates in accordance with other fundamental laws and regulations governing science and higher education in Croatia: the Act on Quality Assurance in Higher Education and Science (OG 151/2022), the Act on Academic and Professional Titles and Academic Degree (OG 107/2007,

118/2012), the Croatian Qualifications Framework Act (OG 22/2013, 41/2016, 64/2018, 47/2020, 20/2021), and the Act on the Student Council and Other Student Organizations (OG 71/2007).

The Faculty aligns its activities with numerous other ordinances arising from statutory and legislative provisions, which are available on the Faculty's official website (Regulations).

ACADEMIC FREEDOMS

Freedom of scientific and professional research and creativity, as well as cooperation and networking, are academic freedoms guaranteed to all members of the academic community, in accordance with the Constitution of the Republic of Croatia and applicable law.

Members of the academic community include all teachers, researchers, associates, students, alumni, public service employees, and other participants in higher education, scientific research, and professional work.

According to Article 9 of the Statute of the Faculty of Geotechnical Engineering (2023), members of the academic community are guaranteed academic freedoms, which particularly include: freedom of scientific research, freedom of expression, publication, and teaching, freedom to express personal opinions about the system, the University, and the Faculty, the right to mutual cooperation and association, and the right to direct and indirect participation in collegial governing bodies and expert bodies of the University and/or the Faculty.

FACULTY MANAGEMENT

According to Article 10, paragraph 1 of the Statute of the Faculty of Geotechnical Engineering (2023), the governing bodies of the Faculty are the Dean and the Faculty Council. The work of the Faculty of Geotechnical Engineering is supervised by the University of Zagreb, i.e., by the Rector, in accordance with the Statute of the University of Zagreb and other general acts. The powers of the Dean and the Faculty Council are defined by the Statute of the Faculty of Geotechnical Engineering (2023).

- **FACULTY MANAGEMENT BOARD**

In accordance with the Statute of the Faculty of Geotechnical Engineering (2023), the Faculty is managed by the Dean, who is its head and chief executive. The Dean holds the powers and responsibilities of the institution's director and is employed full-time. The Dean is responsible for the operation and activities of the Faculty and is accountable to the Faculty Council and the Rector of the University of Zagreb.

The Dean is assisted in his/her work by Vice-Deans and the Faculty Secretary. The Dean's advisory body for scientific, teaching, and professional matters is the Dean's Board. Its narrow composition includes the Dean, Vice-Deans, and the Faculty Secretary, while the extended composition also includes the Department Heads and the Chair of the Quality Assurance Committee. Other Faculty staff members may be invited to meetings depending on the subject matter.

Three elected Vice-Deans (Vice-Dean for Education, Vice-Dean for Science, Vice-Dean for Management) ensure through their work:

- the coordinated implementation of teaching processes, scientific research, and professional development activities in line with strategic objectives
- the execution of obligations towards the University and the competent Ministry related to the operation of the Accounting Office, Library, Undergraduate and Graduate Student Administration Office, Doctoral Student Administration Office, Office for International Cooperation, IT Support Service, the newly established Centre for Research and Student Support (CEPIS), and the Quality Management Office (URKVA-GFV).

The Dean's Board, in accordance with Article 28 of the Statute of the Faculty of Geotechnical Engineering (2023), is an advisory body to the Dean on scientific, educational, professional, legal, and financial matters concerning the work of the Faculty and its organizational units and bodies. The Dean convenes and chairs the meetings of the Dean's Board. The Dean's Board may meet in narrow or extended composition. The narrow composition includes the Dean, Vice-Deans, and the Faculty Secretary. The extended composition includes the Dean, Vice-Deans, Department Heads, the Faculty Secretary, and the Chair of the Quality Assurance Committee.

- **FACULTY COUNCIL**

According to Article 20, paragraph 1 of the Statute of the Faculty of Geotechnical Engineering (2023), **the Faculty Council** consists of: all employees in scientific-teaching positions, one representative from teaching positions, one representative from associate positions, student representatives who make up 10% of the total number of Faculty Council members (of which no more than 20% may be doctoral students), and one representative of other employees who are not otherwise represented in the Faculty Council.

The representative from teaching positions, according to Article 20, paragraph 2 of the Statute of the Faculty of Geotechnical Engineering (2023), is elected by employees from among themselves at a meeting convened by the Dean, for a term of three years. The same person may be elected no more than twice consecutively.

The representative from associate positions, according to Article 20, paragraph 3 of the Statute, is elected by employees from among themselves at a meeting convened by the Dean, for a term of three years. The same person may be elected no more than twice consecutively.

The representative from other employees who are not otherwise represented in the Faculty Council, according to Article 20, paragraph 4 of the Statute, is elected by employees from among themselves at a meeting convened by the Dean, for a term of three years. The same person may be elected no more than twice consecutively.

Students participate in the work of the Faculty Council through directly elected representatives and deputies, serving a two-year mandate. Student members of the Faculty Council are elected in accordance with Article 20, paragraph 5 of the Statute of the Faculty of Geotechnical Engineering (2023), the Statute of the University of Zagreb (2023), the Statute of the Student Council of the Faculty of Geotechnical Engineering (2017), and the Act on the Student Council and Other Student

Organizations (2007). If an elected student representative's mandate ends prematurely, their deputy assumes the role without a new election.

According to Article 20, paragraph 7 of the Statute of the Faculty of Geotechnical Engineering (2023), a representative of each representative trade union active at the Faculty of Geotechnical Engineering in the field of science and higher education participates in the Faculty Council without voting rights. This representative must be an employee of the Faculty.

The rules of procedure of the Faculty Council are regulated by the Rules of Procedure of the Faculty Council of the Faculty of Geotechnical Engineering (2023).

- **WORKING BODIES OF THE FACULTY COUNCIL AND THE DEAN**

The permanent working bodies of the Faculty Council are: the Teaching Committee, the Science Committee, the Postgraduate Studies Committee, the Library Committee, the Quality Management Committee, the Gender Equality Committee, the Ethics Committee, and the Disciplinary Committee. The Faculty Council adopts the decision on the appointment of members of permanent working bodies and the duration of their mandate. The powers, tasks, and mode of operation of the permanent working bodies of the Faculty Council are regulated by the general acts of the Faculty.

When the Faculty Council establishes ad hoc working bodies, the decision on their establishment defines the guidelines or mode of operation, as well as the tasks and members of the ad hoc working body. The Faculty Council may evaluate the reports and work of the ad hoc working bodies and accordingly accept, reject, or request their revision.

The International Scientific Advisory Board of the Faculty of Geotechnical Engineering (ISAB-GFV), in accordance with Article 26 of the Statute of the Faculty of Geotechnical Engineering (2023), is a special advisory body to the Dean and the Science Committee, established in 2022. ISAB-GFV is focused on enhancing the international scientific visibility and the internationalization of the Faculty's scientific activities. The Faculty Council adopts the decision on the appointment of ISAB-GFV members and the duration of their mandate. The members of ISAB-GFV, in cooperation with the Science Committee, define the mode of operation and meeting schedule.

The Economic Council of the Faculty of Geotechnical Engineering, in accordance with Article 27 of the Statute of the Faculty of Geotechnical Engineering (2023), is a special advisory body to the Dean. The members of the Faculty's Economic Council are typically representatives of distinguished legal entities from the economy whose activities are of interest to the work, mission, and overall development of the Faculty. The mode of operation and role of the Faculty's Economic Council are defined by the Dean's decision. The Dean also adopts the decision on the appointment of its members and the duration of their mandate. The members of the Economic Council define the meeting schedule in cooperation with the Vice-Dean for Management. The Economic Council is planned to be established during the 2025/2026 academic year, once all processes related to the selection of members of this future advisory body are completed.

INTERNAL STRUCTURE AND SYSTEMATIZATION OF JOB POSITIONS

The Faculty of Geotechnical Engineering regulates the structure of job positions, the organization of tasks, the titles of positions, and the requirements that employees must meet to perform specific duties, on the basis of the Ordinance on Internal Structure and Systematization of Job Positions (2024). The number of employees in particular positions and the coefficients of job complexity are determined in accordance with legal regulations, government decrees, decisions of the University of Zagreb, decisions of the competent ministry, the collective agreement, and decisions of the Dean.

The structure and organization of the Faculty of Geotechnical Engineering (Organisational chart), as detailed in the aforementioned Ordinance, are defined by the Statute of the Faculty of Geotechnical Engineering (2023).

FINANCIAL OPERATIONS OF THE FACULTY

Further details on the financial operations of the Faculty of Geotechnical Engineering are provided in Chapter 4.6. *The higher education institution ensures the necessary financial resources for the performance of teaching, scientific, and professional activities*, and maintains two separate official subpages: Financial Operations and Public Procurement. These pages provide public access to numerous financial documents, such as: a list of business entities with which the Faculty of Geotechnical Engineering has a conflict of interest; the current *Ordinance on Simplified Procurement* (as well as all previous versions); the current *Public Procurement Plan* (as well as all previous versions), public procurement procedures and contract registries by year; the current *Financial Plan* (as well as all previous versions); annual financial reports; monthly expenditure reports.

HUMAN RESOURCES

- **STAFF WORKLOAD**

Since the entry into force of the Collective Agreement for Science and Higher Education (KUZVO) in December 2018, each year—pursuant to its provisions—the total workload for the previous academic year is calculated, as well as projections of teaching, research, and institutional workload of staff for the upcoming academic year. Both projections and calculations are presented first at the extended Dean's Collegium and subsequently at the Faculty Council.

- **Workload projections**

Workload projections are prepared based on data regarding:

- planned teaching at the undergraduate and graduate level (course implementation plan and ISVU system)
- planned teaching at the doctoral level
- planned engagement at other higher education institutions based on issued approvals
- research activity within different projects (data from the Science Committee)
- project-contracted shares of working time (data from project leaders)

- institutional contribution pursuant to KUZVO (Art. 58(4), Art. 67(1), Art. 72(1)
- additional duties in accordance with specific Dean's decisions on the percentage of working time allocated for additional assignments, as well as statutory provisions (course scheduling, trade union activity, occupational health and safety, EU project funds, etc.).

The collected data and decisions form a solid basis for the Dean's decision on the composition of each staff member's workload for the upcoming academic year. Workload projections are presented at the Faculty Council, usually at the end of the current academic year, and are then forwarded to all departments, which must discuss the necessary measures to balance the workload of members who are under- or over-allocated.

- **Workload calculation**

The workload calculation for all staff in the recently completed academic year is based on:
- actual teaching delivered at undergraduate, graduate, and doctoral level
- engagement at other Higher Education Institutions (HEIs) based on approvals issued by the Faculty Council
- research activity within various projects and institutional projects
- project-contracted shares of working time
- institutional contribution pursuant to KUZVO
- additional duties in accordance with specific Dean's decisions and similar (course scheduling, trade union activity, occupational safety, etc.).

The workload calculation for all staff is also presented at the Faculty Council, usually at the start of the new academic year, with the possibility for staff members to submit requests for corrections.

- **HUMAN RESOURCE MANAGEMENT PLAN**

Over the past five years, at the beginning of each academic year, the University of Zagreb has prepared a consolidated Human Resource Management Plan, based on data collected in November from all constituent units, including the Faculty of Geotechnical Engineering.

At the Faculty level, the Human Resource Management Plan was adopted annually from 2020 to 2024, on the basis of previously established criteria (Criteria for 2021, Criteria for 2022, Criteria for 2023, Criteria for 2024). These criteria are not adopted by the Faculty Council but are determined by the Dean's discretionary right, who in the previous period also sought approval from the extended Dean's Collegium for the proposed criteria.

Based on the adopted criteria, department heads submit within the set deadline their proposals for promotions and new employments within their departments, along with supporting documentation if applicable. A thematic session is then held where acceptable proposals are presented and adopted, and a projection is prepared for the following two to three years.

A novelty introduced in 2023, compared to previous years, was that each employee is required to independently initiate the procedure for promotion to a higher position, by submitting a request to the Faculty of Geotechnical Engineering, in accordance with Art. 19(3)(8) and Art. 43(2) of the Act on Higher Education and Scientific Activity *(*OG 119/2022*)* and pursuant to Art. 82(1) of the Statute of the Faculty of Geotechnical Engineering. Accordingly, promotion is enabled for all those who meet the required conditions.

The final draft of the Human Resource Management Plan is prepared by the Dean in line with the final conclusions of the extended Dean's Collegium and the guidelines of the University of Zagreb, with the possibility of correcting submitted data when requested by the University of Zagreb.

- **NEW REGULATION ON COEFFICIENTS AND NEW EMPLOYMENT CONTRACTS**

In accordance with the Act on Salaries in State and Public Services (OG 155/2023) and the Regulation on Job Titles, Conditions for Assignment, and Coefficients for Salary Calculation in Public Services (OG 22/2024), new employment contracts were signed with all employees of the Faculty of Geotechnical Engineering as of 1 March 2024. The preparation and signing of the new contracts were preceded by several consultations and iterations of the draft employment contract at the level of the extended Dean's Collegium, the Faculty Council, and the Union, i.e., the union representative active at the Faculty.

- **ALIGNMENT WITH THE NEW RULEBOOK ON EMPLOYMENT**

Since the Rulebook on Employment of the Faculty of Geotechnical Engineering (2023) was adopted at the Faculty Council session in the academic year 2022/2023, held on 13 September 2023, during the academic year 2023/2024 a series of necessary adjustments were made to align with the provisions of the new Rulebook, especially those provisions that introduced new elements, such as the protection of employee dignity and the protection of children and minors.

SCIENTIFIC, PROFESSIONAL AND RESEARCH WORK

The Faculty of Geotechnical Engineering supports continuous and professional scientific and professional research activities and creativity of its staff and students, as well as the public dissemination and publication of the results of such activities, whereby staff and students must act in line with the mission and vision of the Faculty (Art. 100 of the Statute of the Faculty of Geotechnical Engineering, 2023).

An employee who shows interest in creating inventions or researching possibilities for technical improvements related to the activities of the Faculty may, by special decision, be granted financial support for professional literature or necessary equipment (Art. 75 of the Rules of Operation of the Faculty of Geotechnical Engineering, 2023). In this process, they also have access to the basic services of the Faculty's Technology Transfer Office (TTO).

In accordance with the labour law, an employee may perform work that is within or related to the activities of the Faculty outside of the Faculty itself, but only with the Dean's approval and in accordance with the general act of the Faculty defining the procedure for issuing such approval. For the Faculty of Geotechnical Engineering, this is stipulated by Art. 91 of the Statute (2023) and Arts. 26–29 of the Rules of Operation of the Faculty of Geotechnical Engineering (2023).

EDUCATION AND TRAINING FOR WORK

The Rules of Operation of the Faculty of Geotechnical Engineering (2023), Arts. 79–82, provides for the possibility of education and training of employees, including schooling, education, training, and professional development. Employees, in line with their abilities and the needs of the Faculty, are expected to undertake education, training, and professional development for their work.

The Faculty enables employees to undergo training in accordance with the needs of their contracted duties, at the Faculty's expense. Time spent on such training counts as working hours and, where possible, takes place during the employee's regular working schedule. This particularly applies in cases of changes or introduction of new methods or work organisation, training on new equipment or software, mandatory training for safe work practices, or necessary training to secure authorisations required for the work performed by the employee, including the renewal of such authorisations.

PUBLICITY OF OPERATIONS

The work of the Faculty of Geotechnical Engineering is public. The Faculty addresses the public with respect, based on mutual recognition and cooperation.

The publicity of the Faculty's work is ensured particularly through:

- public accessibility of data entered into the appropriate registers and records
- submission of the annual financial report
- submission of the annual report on the implementation of the Faculty's development strategy (Dean's Report for academic year 2022/2023 and Dean's Report for academic year 2023/2024), monthly reports on the use of funds and Faculty operations
- organisation of events (symposia, conferences, round tables, and other events) opens to the public
- making data publicly available on the Faculty's website and social media
- publication of books, bulletins, brochures, posters, and other materials
- publication of the specialised journal „Environmental Engineering"
- allowing free auditors to attend lectures without enrolling in courses or taking exams, with the course leader's approval
- other appropriate and necessary means.

The Statute, as well as all other general acts and information considered essential, are published on the Faculty's website in an accessible and searchable manner.

Access to information is ensured in accordance with the law. The right of access may only be restricted in cases of abuse or for the protection of classified information and personal data. The Dean is responsible for enforcing the provisions related to business confidentiality. The Faculty may restrict access to information classified as business secrets, particularly concerning data:

- of special interest to the University or the Faculty, declared business secrets or confidential by the Senate, Rector, Faculty Council, or Dean
- relating to measures and procedures in extraordinary circumstances
- declared confidential by the competent state authorities.

1.3 The higher education institution ensures the collection, analysis, and use of information relevant for the effective management of all activities and publishes information about its work

The higher education institution, through its quality assurance system and available information systems, collects data (on employees, students, programmes, and other areas) using various methods, analyses them, and applies relevant information for the purpose of monitoring trends, reporting on its activities, planning further activities, and making evidence-based decisions. Students and other stakeholders are included in these processes.
The higher education institution uses information systems to monitor indicators of compliance with the legal requirements for carrying out higher education and scientific activities, where applicable.
The higher education institution has a digital transformation strategy for education, which is integrated into the overall strategies for institutional development and quality enhancement.
The higher education institution keeps electronic records of data and ensures access to and exchange of data in accordance with the national legislative framework.
The higher education institution has prescribed measures for the use of information systems and the safeguarding of information security, and consistently implements them.
Clear, accurate, objective, and up-to-date information about study programmes and the work of the institution is publicly and easily available in Croatian and in one of the world languages.
The higher education institution is obliged to inform the interested public about admission criteria, enrolment quotas, study and educational programmes, learning outcomes and qualifications, forms of support available to students, procedures applied in teaching, learning and assessment, pass rates and learning opportunities available to students, as well as information on the employment of graduates.

At the Faculty of Geotechnical Engineering, an administrative and technical IT Support Service has been established as part of the Secretariat organizational unit, through which activities related to the collection and processing of data at the Faculty have been facilitated. In order to further strengthen the role of the IT Service, Article 18, paragraph 3, item 1 of the Statute of the Faculty of Geotechnical Engineering (2023) stipulates that the Vice Dean for Management coordinates the work of this Service, with the aim of achieving faster and more direct communication with the Faculty Management.

The Vice Dean for Education regularly collects and updates data and submits reports on the work of the Faculty Council working bodies dealing with undergraduate and graduate studies. The information is presented to the Faculty Management, at Department meetings, and at Faculty Council sessions. Reports include analyses of student pass rates at examinations, analyses of reasons for early student withdrawal from studies, analyses of the level of implementation of measures to improve teaching quality, and similar. Based on the reports and analyses, discussions are held on the reasons for identified nonconformities, and proposals for improvements are provided.

To improve the quality of teaching and the teaching process, an anonymous physical suggestion box is also used as a place for all student positive and negative experiences in the teaching process. It serves as a channel for collecting anonymous student feedback. The box is available throughout the academic year. Upon receiving information, the Vice Dean for Education conducts an analysis and makes a proposal for the improvement of a specific segment of the teaching process identified as needing enhancement.

The Faculty of Geotechnical Engineering also collects data through direct communication with students, via meetings between undergraduate students and their student advisors. The system of student advisors at the undergraduate level was established in the academic year 2017/2018, and since then advisors—essentially “mentors throughout the study”—have been appointed every year.

Advisors hold meetings with students as needed and help them find the best solutions when they encounter problems during their studies

UNIVERSITY COMPUTING CENTRE (SRCE) SERVICES

The University Computing Centre of the University of Zagreb (SRCE) is the central infrastructural institution that, for the needs of the academic and research community, plans, develops, and improves e-infrastructure and digital services, while also providing support for their use. The services and resources of SRCE store a large volume of data, and the data displayed in the reporting system represent selected indicators as well as an overview of all SRCE services.

Since the beginning of 2025, the SRCE Reporting System for institutions in the science and higher education system, including the Faculty of Geotechnical Engineering, has enabled a systematic overview of data on the services and the use of SRCE's available resources. After authentication via an AAI@EduHr user account, representatives of the Faculty of Geotechnical Engineering can view a report generated specifically for the Faculty. An overview of aggregated data across all institutions is also available without prior authentication.

The data available through the reporting system are collected mostly automatically (via API) from the information systems managed by SRCE. The data are updated monthly in most cases. The status of SRCE services used by the Faculty of Geotechnical Engineering (July 2025) is as follows:

Computing and network services 3/5 (60% implemented):

- Advanced computing, VDC – Virtual Data Centres, eduroam – roaming network access

Data, repositories, and open science 3/4 (75% implemented)

- Digital Academic Archives and Repositories (Dabar); Data storage and management (Puh); Portal of Croatian scientific and professional journals (Hrčak)
- Remaining to be implemented: Support for open science

Information support for administration and business 5/6 (83% implemented)

- Information support to HEIs (ISVU); Information support for science (CroRIS); Information support for student standard (ISAK); Information system for records in higher education (ISeVO); Croatian Qualifications Framework (CROQF)

Digital education 2/5 (40% implemented)

- Support for digital education – e-learning system (Merlin); software to verify the authenticity of papers (Turnitin)
- Remaining to be implemented: SRCE's educational programs; support for open education; webinar system

Digital tools 2/4 (50% implemented)

- Large file transfer; Microsoft product distribution
- Remaining to be implemented: Video conferencing system; Survey tool.

Below are some of the SRCE services most frequently used at the Faculty of Geotechnical Engineering.

- **AUTHENTICATION AND AUTHORIZATION INFRASTRUCTURE**

The Authentication and Authorization Infrastructure of the science and higher education system (AAI@EduHr) enables all users of the Faculty of Geotechnical Engineering (students, teachers, and staff) to use online services simply, securely, and reliably through a unique electronic identity. The electronic identity is not a "user account" for a single service, but rather provides access to a wide range of different services—such as connecting to the internet through various service providers, accessing computing resources, and logging into many web applications, e.g., remote learning systems, online databases, ISVU Studomat, etc. The electronic identity often allows the holder to access their personal data and to exercise various material rights. It also provides access to many services outside the borders of the Republic of Croatia through the global eduGAIN system.

Access to services and the use of AAI@EduHr is enabled via the Faculty of Geotechnical Engineering's own LDAP directory, which stores users' electronic identities. Service users include all members of the Faculty, in accordance with the usage rules defined by SRCE's Regulations on the organization of AAI@EduHr. Electronic identities can be requested and obtained exclusively through the Faculty's IT Support Service.

Upon assignment of an electronic identity, each user receives a unique username and password. The electronic identity takes the form of userID@institution.hr. Users retain the right to their electronic identity in the AAI@EduHr system for as long as they are affiliated with the Faculty of Geotechnical Engineering. At any time, users may access information about their electronic identity and its use via the following web link: https://moj.aaiedu.hr.

The coordination, development, and maintenance of the AAI@EduHr system is carried out by SRCE.

- **ISVU - Information system of Higher Education Institutions (HEIs)**

Information system of HEIs (ISVU) is a web-oriented modular information system that supports business processes related to teaching at higher education institutions and to monitoring students' progress, as prescribed by legal acts as well as university statutes and regulations in the Republic of Croatia. It consists of several modules that support the standard activities of every institution using it, including the Faculty of Geotechnical Engineering. For example: Studomat for students, Teacher Portal for lecturers, the Studies and Students module for student offices, and the Postgraduate Studies module for doctoral administration. These modules enable management of a central database.

The system records and stores data on students, teachers, courses, curricula and syllabi, enrolments, examinations, thesis topics, and graduation. Key performance indicators and system usage statistics are publicly available on dedicated overview pages. The Data Warehouse module enables viewing and analysis of data generated within ISVU, preparation of statistical reports for the institution, and ad hoc reporting.

The Ministry of Science, Education and Youth provide funding for the development and regular functioning of ISVU and supervises its operation. The development of software support, system maintenance, and information support for higher education institutions in student administration through ISVU are carried out by SRCE. At the Faculty of Geotechnical Engineering, an ISVU Coordinator is appointed who, among other tasks, oversees the system and processes/delivers data when

necessary. Additionally, the Dean issues a decision designating authorized persons for coordinating and handling specific categories of data within the ISVU system.

- **MERLIN SYSTEM**

For communication with students—including the posting of announcements, teaching materials, and instructions, as well as sharing information about study programs, approval procedures, and updates to curricula—the Faculty of Geotechnical Engineering has been using the SRCE e-learning system Merlin free of charge for more than ten years. Today, nearly every course at the undergraduate, graduate, and doctoral levels has an open e-course with a dedicated Merlin page. The Merlin e-learning system enables teachers to deliver courses more effectively and allows students to better follow and master the material covered in their courses.

An additional "upgrade" to the use of the Merlin system occurred during the COVID-19 pandemic, when Merlin, due to its stability and reliability, was used not only as an instructional tool but also as an additional channel for communication with students and staff. At that time, two entirely non-teaching e-courses were established: "Zbornica" *(Staff Room)* for teachers and "Referada" *(Student Office)* for students. These remain active and have become central platforms for sharing all current news and materials—like Microsoft's SharePoint or Teams systems.

Access to Merlin is enabled for students and teachers through their AAI@EduHr electronic identity. Maintenance and upgrades of Merlin, which is based on the open-source Moodle platform, are the responsibility of SRCE staff at the E-Learning Centre, who ensure its reliable and continuous operation. Today, Merlin is considered the most advanced e-learning system in the Republic of Croatia. Its virtual learning environment consists not only of the Merlin e-learning system itself, but also of an integrated webinar system and an e-portfolio system. Conditions of use are defined by SRCE's Regulations on the Organization and Use of the Merlin E-Learning System.

Merlin is also integrated with ISVU, which allows institutional administrators to automatically create all ISVU courses within Merlin and to enrol teachers and students. To better coordinate the use, creation, and modification of e-courses at the Faculty of Geotechnical Engineering, a designated person is appointed to manage e-courses, responsible for data entry and keeping e-course information up to date.

In addition, the Teaching Committee and the Research Committee address current issues related to the organization, implementation, and improvement of teaching processes using e-learning. Merlin also enables monitoring and access to statistical data, such as the number of page visits, access to teaching materials, performance on e-tests and exams, and other usage indicators.

- **REMOTE TEACHING SYSTEMS**

SRCE's webinar system enables the delivery of classes, presentations, lectures, workshops, seminars, and meetings via the internet, using the Adobe Connect and eduMeet platforms. Adobe Connect is a more advanced system, offering features such as lecture recording, screen sharing, document sharing, a whiteboard for writing, participant polling, and remote desktop control, making it suitable for longer lectures. EduMeet is primarily used for online lectures and meetings, does not support recording, and

is simpler to use. Both systems are integrated with the Merlin system, allowing users to log in using their AAI@EduHr electronic identity

- **DABAR**

The Digital Academic Archives and Repositories (DABAR) is a national system that enables the simple establishment and maintenance of reliable and interoperable institutional and thematic repositories, while systematically ensuring the preservation of scientific, educational, and creative outputs in digital form. Developed by SRCE in cooperation with Croatia's academic and research community, DABAR is now a key component of the national e-infrastructure data layer, providing a secure environment for the development and maintenance of digital collections through functionalities for permanent storage and dissemination of diverse digital objects.

The Faculty of Geotechnical Engineering has used DABAR since its inception, regularly uploading all defended undergraduate and graduate theses from its Environmental Engineering study program. The repository currently contains more than 300 master's theses and nearly 350 bachelor's theses, with over 60% available in open access. The Faculty Library is responsible for operating the system and for uploading final theses.

- **CRORIS**

CroRIS is the new national Croatian Research Information System (CroRIS) established by SRCE for the Ministry of Science, Education and Youth. It has partly integrated some existing systems and software solutions, while also connecting to others, including international systems.

The Faculty of Geotechnical Engineering has appointed a CroRIS Coordinator, nominated and dismissed by the Dean, who may further appoint an editor authorized to verify and approve the accuracy of data entered into CroRIS.

CroRIS consolidates large volumes of information on research activities at every higher education institution in Croatia, including the Faculty of Geotechnical Engineering. In one place, it provides unified data on researchers, projects, studies, publications (linked with the CROSBI database), products, patents, equipment and services, their usage, and more. CroRIS also facilitates the systematization of statistical data.

- **ISeVO – Informacijski sustav evidencija u visokom obrazovanju**

Information System of Higher Education Registers (ISeVO*)* is a relatively new system developed by SRCE. Its pilot use began in 2024, with completion planned for the end of 2025. Current modules include: Digital Diploma Register, Higher Education Institutions Browser, Study Programs Browser, User Administration, and Resource Management. Modules under development include the Student Records and Admissions Records modules (with admissions results), as well as the Higher Education Staff Records module. Once complete, ISeVO will serve as the central register of key entities in Croatian higher education.

For the Faculty of Geotechnical Engineering, the Digital Diploma Register—in operation since 1 January 2024—is of particular significance. Since then, higher education institutions, including the Faculty, have been required to issue diplomas and diploma supplements (final graduation documents)

in both printed and digital form, with digital copies submitted to the Digital Diploma Register. At the same time, historical records of previously issued diplomas and certificates in Croatia, covering the period from 1984 to the end of 2023, are being entered into the system

CARNET SERVICES

The Croatian Academic and Research Network (CARNET) is a public institution operating within the Ministry of Science, Education and Youth in the field of digital technologies and their application in education. CARNET is also an internet service provider in Croatia. Today, the Faculty of Geotechnical Engineering uses three core CARNET services: a permanent network connection, training, and certificates for digital signatures and seals.

The CARNET network currently connects the academic, scientific, and research communities of the Republic of Croatia. The permanent connection service enables member institutions to maintain continuous connectivity with the CARNET network. Institutions within the Ministry of Science, Education and Youth gain access through their local networks, which are linked to the CARNET network via leased communication lines. Member institutions are connected using transmission lines of varying technologies and speeds, depending on the infrastructure of telecommunication providers, the needs of member institutions, market changes, and other factors. CARNET currently cooperates with all major telecommunication providers in Croatia.

CARNET Training provides support in developing the digital competencies of the educational and academic community. Training topics focus on the purposeful and effective use of digital technologies in teaching, learning, and the operation of educational institutions.

To ensure that CARNET-related activities remain available and functional at all times, the Faculty of Geotechnical Engineering has appointed both a CARNET Coordinator and a CARNET System Administrator

- **QUALIFIED ELECTRONIC SIGNATURE AND SEAL**

One of the specific CARNET services implemented at the Faculty of Geotechnical Engineering, aimed at process digitalization, was introduced through the e-University project by providing a qualified electronic signature and seal. Certificates for electronic signatures and seals are available at the Faculty such that the Dean, the CARNET System Engineer, and the CARNET Coordinator hold qualified electronic signatures, while the Dean alone holds the qualified electronic seal. The certificates have been in use since December 2023.

This CARNET service aims to digitalize operations, is compliant with the EU Parliament's eIDAS Regulation, and carries the same legal effect as a handwritten signature and physical seal. CARNET is accredited as a registration authority, registering users and verifying identity and identification data for issuing certificates provided by "Agencija za komercijalnu djelatnost d.o.o." (AKD), accredited as the certification authority.

The remote electronic signature enables the qualified signing of documents via mobile phones, electronic signature for individuals (card-based), qualified electronic signing with a card and reader,

and a remote electronic seal that allows qualified sealing of diplomas, contracts, and other documents using any internet-enabled device

MS 365

With the transition of the Faculty of Geotechnical Engineering to Microsoft 365 (MS365), formerly Microsoft Office software support, during the period since the last re-accreditation, the number of available tools has increased significantly. Today, in addition to the classic Office tools such as Word, Excel, and PowerPoint, more than thirty other applications are available to all employees and students.

For the purposes of simplifying the organization and monitoring of the management system, data collection, communication, and collaborative work, the Faculty uses a wide range of MS365 collaborative applications (e.g., MS Teams, SharePoint), which are directed towards the work of individual organizational units as well as the organization of project activities. All Faculty employees have access to these applications.

To ensure timely information on planned, new, or rescheduled meetings, sessions, and other events at the Faculty of Geotechnical Engineering throughout the academic year, the GFV iCalendar is prepared annually using MS Planner. This enables all employees and students to automatically add Faculty-related events to their personal e-calendars without interfering with their existing personal events. The calendar only needs to be added once and is automatically updated each year with new events.

In addition, all employees are provided with free Microsoft OneDrive cloud storage, which allows both the storage and sharing of documents created and used in the work environment.

These and all other software solutions used at the Faculty of Geotechnical Engineering are integrated within the Microsoft 365 Copilot package, the subscription and use of which are provided by the Ministry of Science, Education and Youth. Access to all MS365 applications is enabled through the AAI@EduHr identity.

Furthermore, in recent years, the migration of key network services from local Faculty servers to the cloud has been completed (web and DNS to SRCE, email and Office tools to Azure), which has reduced the load on local network equipment—primarily the Faculty's servers—while increasing service availability and data security.

To ensure that Microsoft support-related activities are always available and functional, the Faculty's IT Support Service is responsible for these tasks.

NEXT STEPS IN DIGITAL TRANSFORMATION

- **e-UNIVERSITY PROJECT**

Based on the Agreement signed on October 31, 2023, with the Croatian Academic and Research Network (CARNET), the Faculty of Geotechnical Engineering participates in the e-University project

(No. 239-17-100-700/23). The project last until December 31, 2025, and a complete analysis of the outcomes will only be possible after its completion.

The general objective of the project is to improve the quality and accessibility of the higher education system by strengthening flexibility and innovation through support for investments in digital teaching infrastructure. Actions already undertaken, and those confirmed to be implemented, include investments in network and computer infrastructure (network equipment, routers, switches, and WiFi access points), equipment to produce audio/video content, and associated services (applications, licenses, and support tools). These measures will modernize the IT infrastructure of the Faculty of Geotechnical Engineering.

Furthermore, through the project the Faculty will obtain licenses for software intended for the creation of digital educational content (DEC) as well as a multimedia studio, thereby becoming fully equipped—both in terms of software and hardware—for the independent production of digital educational materials.

By upgrading the existing information system and linking higher education records, a unified platform will be created, containing timely and relevant information for monitoring trends at all levels of decision-making. This platform will also serve as a key database for monitoring the system, producing reports and analyses, and planning future activities.

- **PLANNED DIRECTION OF FURTHER DIGITAL TRANSFORMATION**

The Faculty of Geotechnical Engineering continues its digital transformation processes, following the Strategic Guidelines for Digital Transformation of the University of Zagreb until 2032 and the Digital Croatia Strategy until 2032. With this step, the Faculty aims to align with the broader framework of the digital transition in higher education, consistent with national and European strategic guidelines

The planned direction of digital transformation will emphasize several key areas:

- digitalization of remaining business and administrative processes, thereby improving efficiency, transparency, and service accessibility for students and staff
- intensifying the development of digital competences among staff and students through targeted training and the encouragement of modern digital tool use
- modernization of digital infrastructure—from IT and network equipment to software solutions—which is a key prerequisite for successful digitalization and is expected to be largely achieved through CARNET's e-University project
- in line with open science and open education practices, promoting open access to research results and educational content, thereby strengthening a culture of knowledge sharing and collaboration within the academic community
- continued support for the introduction of modern digital tools into the teaching process, including e-learning, collaborative tools, and other innovative technologies that enhance interaction and the learning experience.

In achieving these goals, the Faculty will rely on the positive experiences of other University of Zagreb constituents that have already made significant progress in digitalization (e.g., FOI and FER), as well as on the professional support of the University Computing Centre (SRCE).

HUMAN RESOURCES MANAGEMENT AND BUSINESS OPERATIONS

- **HUMAN RESOURCES OFFICE**

Employee and external associate data are collected by the Faculty Secretariat of the Faculty of Geotechnical Engineering through the General and Human Resources Office. Each employee has a personnel file. Faculty personnel files contain all data related to employment contracts, appointments to positions, reports of appointment committees, and similar documentation.

Data are regularly updated through the Centralized Payroll System (COP), which has been established at the national level for all public institutions in the Republic of Croatia. COP is a business-information system designed to manage expenses related to human resource costs in the public sector. It ensures payroll calculation and payment of other material rights, compensations, and other income to employees and external associates, as well as high-quality reporting and analytics of paid salaries at the levels of the entire system, groups of institutions, individual institutions, and employees

- **OFFICE ADMINISTRATION**

Office administration at the Faculty of Geotechnical Engineering is primarily carried out through the Dean's Office, which is part of the Secretariat. Office operations were digitalized almost ten years ago with the aim of replacing manual record-keeping and registry tasks, thereby facilitating and accelerating work with large volumes of cases and documents and ensuring that all information can be obtained upon request within a very short period.

In the meantime, the entire process has been aligned with the Ordinance on Office Administration of July 10, 2021, and complies with the ISO 15489-1:2016 standard. The Faculty uses the services of KONTO d.o.o. and their software solution Digital Registry with Records Office as well as their digital archive service for documents

- **FINANCIAL OPERATIONS**

Financial operations are also already highly digitalized, again through the services of KONTO d.o.o., and currently include the following financial accounting services:

- general ledger and account balances, SEPA payment orders, receipt of FINA e-invoices and digital archiving; budget planning and execution; contract register; project monitoring; petty cash management (domestic cash register); fixed assets and small inventory in use (inventory control); payroll calculation; calculation of service and copyright contracts; calculation of student internship contributions; materials accounting and purchase orders; invoicing of services with HUB payment slips, sending of FINA e-invoices, and digital archiving.

The plan is to complete the digitalization of business processes by 2026, expanding them to include the following activities:

- digital requisitions and purchase orders, procurement planning, digital document approval, digital record-keeping of travel orders, management of EU projects, personnel records, mobile inventory, and an employee portal (e-portfolio).

For almost ten years, the Faculty of Geotechnical Engineering has conducted its business through digital banking, using the services of Zagrebačka banka d.d. (e-zaba business banking). This internet banking service, intended for business users with a transaction account in Zagrebačka banka, allows:

- simple, fast, secure, and practical execution of payments and collections available 24/7 (the Faculty operates in such a way that each transaction order requires the authorization of two signatories: the Dean and the Vice Dean for Management)
- access to all financial information in one place at any time (statements, account balances, cards, loans)
- full control over financial operations

ONLINE VISIBILITY

- **GFV WEBSITES**

Basic information about study programs, events, and activities of the Faculty of Geotechnical Engineering is published on the official website of the Faculty, where all enrolment criteria for higher years of undergraduate, graduate, and doctoral studies are also posted in a timely manner.

Since the beginning of 2019, the Faculty of Geotechnical Engineering website has been published bilingually, in Croatian and English. However, in line with current trends and the growing implementation of AI solutions, the website is being adapted to be available exclusively in Croatian, with advanced use of online translators. This approach ensures consistency, accuracy, and timeliness of the website in almost any language.

Additionally, three specially adapted web pages have been highlighted as particularly important by both students and external stakeholders: the Career Development Centre, the GOSSIP platform for efficient implementation of professional practice, and the STEM Centre for Children and Youth.

- **WEBSITE FOR PROSPECTIVE STUDENTS**

Since the academic year 2022/2023, a separate website has been established, intended primarily for high school students – prospective first-year students: https://upisi-inzenjerstvo-okolisa.hr/

This website is stripped of unnecessary administrative and formal sections and contains only the most essential information of interest to prospective students: why enrol at the Faculty of Geotechnical Engineering, i.e., the Environmental Engineering program; admission requirements; study courses; fieldwork; professional practice; laboratories and research activities during studies; what it is like to study in Varaždin; and employment opportunities after graduation.

- **INFORMATION PACKAGE FOR STUDENTS**

To inform primarily students, and secondarily the wider academic and professional community, an information package for first-year students – the Freshman Guide – is available in digital form. It is published on the Faculty's website before the beginning of each academic year, along with enrolment information, and is distributed to freshmen via the Merlin system.

Examples of past guides: academic years 2019/2020, 2020/2021, 2021/2022, 2022/2023, and 2023/2024.

The guide provides concise and accessible information on: electronic identity – AAI@EduHr, Studomat, Student Card (X-card), software support, SRCE and CARNET services, Student Centre, Student Dormitory, Student Service, scholarships (state, STEM, University of Zagreb…), Academic Calendar, teaching process (classroom schedules, teaching methods, list of undergraduate courses, suspension and termination of student rights and obligations, demonstratorships), the Merlin e-learning system, year representatives, student mobility, student health services, as well as student activities (Student Council, Alumni Association AMAC-GFV, sports, culture, restaurants).

- **SOCIAL NETWORKS**

In addition to the website, students and stakeholders are also informed through social networks:

LinkedIn: Faculty of Geotechnical Engineering University of Zagreb
Instagram: Geotehnički Fakultet (@inzenjerstvo_okolisa)
Facebook: Studij inženjerstva okoliša - Geotehnički fakultet
TikTok: Geotehnički fakultet SUZG (@inzenjerstvookolisa)
YouTube: Geotehnički fakultet - Inženjerstvo Okoliša

INTRANET SYSTEM OF THE FACULTY OF GEOTECHNICAL ENGINEERING

All adopted documents of the Faculty of Geotechnical Engineering, arising from the activities of various working bodies at the Faculty, are available to all employees through the Faculty's Intranet system. Access is provided to all Faculty employees using their AAI@EduHr identity and appropriate levels of authorization for access to specific folders.

The Intranet is intended as a support tool for employees in their daily work. With the Dean's approval, each employee may request the creation of a new group. Upon approval, the Head of the IT Support Service establishes the group and adds users with the corresponding access rights. The applicant has the right to upload materials to the group and may delegate this right to one or more group members.

- **GROUPS FOR ALL EMPLOYEES**

The groups Public and Public – Records and Decisions are available to all employees of the Faculty of Geotechnical Engineering without exception or restrictions.

To illustrate the scope of available materials on the Intranet, below is the current list of folders in the Public group, each containing all relevant documents related to a particular topic (listed alphabetically):

Academic Calendar and Events Plan; IT Support Centre; Salary Supplements – Request; Domain gfv.unizg.hr; Annual Plans and Reports; Inventory and Disposal of IT Equipment; Simple Procurement; KUZVO; Human Resources; Library; Use of Annual Leave; GFV Memorandum; Forms for International Internships; PUK; Management; Faculty Rulebook 2023; Rulebook on Job Classification (2024);

Procedures for GFV Fiscal Management; Program Funding; Program Funding – Institutional Projects; Travel Orders; Workshop Materials; Re-accreditation 2018; Medical Examinations; GFV Statute 2023; Strategies; Student Surveys (Teaching Staff); Student Surveys (Study Program); Field Work; Visuals; Act on Higher Education and Scientific Activity; Occupational Safety; e-Learning

In the Public – Records and Decisions group, all adopted minutes of the Faculty Council, individual departments, and working bodies, as well as all decisions of the Faculty of Geotechnical Engineering, are archived.

- **OTHER GROUPS**

Other groups on the Intranet are primarily working groups with restricted access, available to members of specific working groups, boards, committees, and similar bodies. Currently, these include:

Faculty Council; Faculty Council Archive; Department of Geotechnics + GeoLab; Department of Water Management + LGO; Department of Environmental Engineering + LIO; Department of General Sciences; Teaching Committee; Science Committee; Postgraduate Committee; Library Board; Quality Management Committee; Ethics Committee; Disciplinary Committee; Dean's Board (Narrow Composition); Dean's Board (Extended Composition); Management; Projects and International Cooperation; Promotion Group; GFV Monograph; STRATEGY; e-University.

LIBRARY SYSTEM

The Library consists of two sections: a reading room with 20 seats and 15 computers available to students for browsing resources and study, and the library area with the librarian's office and a space housing library holding such as core and supplementary literature, collections of theses and final papers, a reference collection, and a journal collection.

The library's holdings are systematically expanded, with acquisitions aligned with the needs of the curriculum. Both domestic and international literature is acquired, mainly textbooks, collections, dictionaries, and handbooks.

Since 2005, the library has used the MetelWin library software, and all materials have been catalogued and made available via an online catalogue.

PROJECT ON ACQUISITION OF KEY PRACTICAL SKILLS IN THE FIELD OF ENVIRONMENTAL ENGINEERING (SPIO)

From 2020 to 2023, the Faculty of Geotechnical Engineering successfully completed the ESF project UP.03.1.1.04.0059 "Acquiring Key Practical Skills in Environmental Engineering" (SPIO). The project's main goals were to establish a sustainable institutional system of professional practice in environmental engineering and to increase the visibility of environmental engineers by providing work experience in relevant settings during their studies.

Through project activities, a wide range of information was collected, analysed, and applied to improve the organization and implementation of professional practice in the undergraduate and graduate Environmental Engineering study programs, as well as to enhance the employability of

graduates by developing key practical skills acquired during studies. Some of the project's tangible results include:

- Development of an Employability Analysis of Environmental Engineering graduates
- Preparation of a Handbook for the Implementation of Professional Practice
- Establishment of the Career Development Centre at the Faculty of Geotechnical Engineering
- Organization of Career Days in Environmental Engineering during each project year
- Introduction of an elective course in professional practice across all years of study
- Development of a permanent program of student field exercises
- Establishment and equipping of the Workshop (MakerSpace) for professional practice programs and construction exercises linked with specific seminars
- Establishment and equipping of a **multifunctional classroom for the application of innovative learning methods**
- Additional equipping of existing laboratories (practicums) to train students in advanced techniques not covered by the regular curriculum
- Facilitation of graduate employment through partnerships with institutions providing professional practice placements
- Improvement of the teaching process by involving employers directly in professional practice
- Establishment of the GOSSIP online platform for staff and participants in professional practice programs

- **GOSSIP – Main Organizational System for Students and Employer**

The digital platform is based on the software developed by the Faculty of Organization and Informatics, University of Zagreb, and adapted to meet the needs and requirements of professional practice in the Environmental Engineering program.

The GOSSIP online platform (https://praksa.gfv.hr/hr/) was successfully tested during the 2022/2023 academic year and has been the exclusive method for students to apply for professional practice since the 2023/2024 academic year. Its purpose is to simplify coordination among students, Faculty practice coordinators, workplace mentors, the Student Office, and overall monitoring of professional practice at the Faculty of Geotechnical Engineering. The administrative component of the system is managed by the Faculty's Career Development Centre (https://crk.gfv.hr/).

- **ANALYSIS OF GRADUATE EMPLOYABILITY**

To provide a detailed overview of the employability of alumni who have completed the graduate university study program in Environmental Engineering, as well as those who completed study programs delivered prior to the introduction of Environmental Engineering, the Faculty of Geotechnical Engineering began systematically monitoring graduate employability in the 2020/2021 academic year. This process started within the activities of the ESF project UP.03.1.1.04.0059 and has since continued through the activities of the Career Development Centre and the Alumni Association AMAC-GFV (Employability Analysis at the Undergraduate and Graduate Study Level).

DIRECT DATA COLLECTION THROUGH THE QUALITY ASSURANCE SYSTEM

By analysing feedback provided by internal stakeholders (primarily students) and external stakeholders (primarily employers), collected through the Quality Assurance System, the Faculty ensures the ability to propose and implement changes crucial to improving the operation of the Faculty of Geotechnical Engineering.

- **STUDENT SURVEYS**

Feedback from students has been systematically collected since 2012 through two types of surveys: the Teacher Evaluation Survey and the Overall Study Evaluation Survey.

Teacher Evaluation Survey at the University of Zagreb has been continuously conducted since the 2011/2012 academic year. Teacher performance has been evaluated using the prescribed Teacher Evaluation Form (V4). Until the summer semester of 2019/2020, the survey followed a triennial cycle defined by the University of Zagreb. Each constituent unit of the University was obliged to carry out teaching evaluations once every three years using the paper-and-pencil method. The University's Office for Quality Management (URKVA) conducted the survey, processed the forms electronically, and delivered results and statistical analyses to the Faculty Dean and the Faculty Quality Assurance Committee. Results were then distributed to each individual teacher. A detailed plan and instructions were published on the University's website (http://www.unizg.hr/anketa-nastavnici)

In the summer semester of 2020/2021 and during the 2021/2022 academic year, as much of the teaching process was conducted online, a digital student survey system was developed within the Higher Education Information System (ISVU) – the ISVU Student Survey via Studomat, using a University-level template. The survey is fully anonymous, and results cannot be linked to student identity. Data are automatically processed within ISVU and made available to teachers after exam periods

This online survey format has continued at the Faculty of Geotechnical Engineering to the present day, with surveys carried out twice annually (at the end of the winter and summer semesters) for all courses and all instructors. Due to relatively low student response rates—students have expressed concerns about the anonymity of the ISVU system—there have been initiatives in recent years to reintroduce paper-and-pencil surveys. However, these initiatives have not been implemented at the University level.

Overall Study Evaluation Survey assesses student satisfaction with the work of administrative and support services at the Faculty, the study program content, delivery of teaching and knowledge assessment, student support, and overall study conditions. Surveys are conducted at the completion of both undergraduate and graduate studies through dedicated questionnaires. Students fill out the survey at the end of their undergraduate studies and again at the end of their graduate studies. At the Faculty of Geotechnical Engineering, this survey is conducted annually. Collected questionnaires are submitted to the University Office for Quality Management (URKVA), which processes the results and delivers reports to the Faculty. Results are considered when revising existing programs or designing new study programs.

Once a year, the Faculty submits to URKVA its Annual Report on the Quality Assurance System and the Quality Assurance Plan for the following academic year. The Faculty's Quality Assurance Committee is

responsible for preparing both the Report for the previous period and the Plan for the upcoming period. Both documents are presented and adopted at the Faculty Council before submission to the University of Zagreb. All reports are made publicly available after adoption and are published on the official website of the Faculty of Geotechnical Engineering.

- **EMPLOYER SURVEYS**

Within the GOSSIP internship system, continuous quality evaluation is carried out through two types of surveys. First, before submitting the Internship Logbook to the mentor for approval, the student must complete an evaluation form assessing the quality of the internship and the mentoring. After that, when the mentor at the employer receives the Internship Logbook for evaluation, they cannot provide their final opinion without first completing an evaluation form assessing the student's performance during the internship and their communication with the Faculty. Survey results are mutually blind, with access granted only to the Internship Coordinator for the study program and the administrator at the Career Development Centre. In this way, by introducing mandatory evaluations that precede the final steps of completing the internship, the Faculty ensures quality monitoring of internship implementation and identification of potential challenges in its execution.

e- CONSULTATIONS AT THE FACULTY OF GEOTECHNICAL ENGINEERING

Before being formally processed and adopted by the Faculty Council, internal e-consultations are conducted at the Faculty of Geotechnical Engineering regarding certain documents that regulate issues of significance for most staff or students. The draft or prepared proposal is made available to all participants of the e-consultation (members of the Faculty Council, and, if necessary, all employees and students). The consultation is held within a pre-defined timeframe.

During the consultation period, the draft or proposal is accessible to all participants on the Faculty's official Intranet site, in a designated folder containing all accompanying documents. Consultations are conducted exclusively in electronic form, through an e-form accessible via a pre-defined web link, requiring authentication with an AAI@EduHr electronic identity. Participation is public, under the participant's full name.

Students are also allowed to provide direct feedback on the draft or proposal by sending written comments via e-mail to poslovanje@gfv.hr if they are unable to access the e-form.

Participants' submissions must be clear, precise, concise, and concrete, and must cumulatively include, for each individual statement, a specific reference to the article, paragraph, or item concerned, along with a precise explanation (balanced in tone) of the reasons for requesting an adjustment, amendment, supplement, deletion, relocation, etc.

The participants' submissions and a consolidated summary of responses to them are published on the Faculty's official Intranet site, in the same folder where the draft or proposal was located during the consultation period.

Examples of successfully completed e-consultations (including guidelines, reports, and responses to received comments):

- Consultation (2023) on the Statute of the Faculty of Geotechnical Engineering
- Consultation (2023) on the Rules of Procedure of the Faculty Council
- Consultation (2023) on the Rules of Procedure of the Faculty of Geotechnical Engineering
- Consultation (2024) on the Rules of Procedure on Undergraduate and Graduate Studies
- Consultation (2024) on the Rules of Procedure on Internal Organization and Job Classification
- Consultation (2025) on the Rules of Procedure on the Use of Earmarked Revenues, Own Revenues, and Non-Earmarked Donations

THEMATIC SESSIONS OF THE FACULTY COUNCIL

The usual agenda items at almost every session of the Faculty Council include adoption of the minutes from the previous session (which subsequently becomes publicly available to all staff), decisions related to human resources, information and decisions related to doctoral studies, reports by the Dean and Vice-Deans, information from Senate sessions, updates on the work of the Quality Management Committee, as well as project and promotional activities. However, from time to time there is also a need for thematic sessions focusing on specific topics of essential importance for the Faculty of Geotechnical Engineering. Below are several thematic sessions held during the period since the last re-accreditation of the Faculty.

January 2021 – Extraordinary session of the Faculty Council (open to all staff), summarized in the Dean's Information 2021-01 and Faculty Council Minutes 2021-01, focused on:

- the earthquake that struck Banovina in December 2020 and its impact on students originating from that area
- contemporary cases of abuse at other higher education institutions, with renewed emphasis to both students and staff on their rights and the procedures for exercising them in cases of abuse/harassment at the Faculty of Geotechnical Engineering
- informing a broader circle of staff about developments regarding the introduction of the new undergraduate study program Environmental Protection, Recycling, and Packaging at the University North, which had just been registered with the Ministry of Science and Education (entry code: 2619), and was scheduled to begin in academic year 2021/2022. The academic title awarded upon graduation was identical to that of our undergraduate program: Bachelor of Engineering in Environmental Engineering.

October 2022 – Thematic session of the Faculty Council, focused on:

- the low number of enrolled students in the new academic year 2022/2023 – based on the previously prepared Analysis of Perceptions of the Current Situation at the Faculty by students and staff, followed by a discussion on the future development of the Faculty (Faculty Council Minutes 2022-10)
- the Final Report on the Implementation of the Action Plan for Quality Enhancement in the Second Cycle of Re-accreditation for the period February 2020 to November 2022

April 2022 – Extraordinary session of the Faculty Council, dedicated to the Presentation of the Agenda of the Dean Candidate for academic year 2022/2023 and 2023/2024, which also contained a brief overview of activities carried out during academic year 2020/2021 and 2021/2022:

- the COVID-19 pandemic (2020–2022), which brought challenges such as the inability to physically attend the Faculty, enforced social distancing, restrictions, monitoring of attendance, numerous isolations and quarantines, posing significant organizational challenges for teaching delivery, adaptation to new conditions, continuation of scientific research, and maintaining as normal a work environment as possible
- the atmosphere of additional insecurity caused by two earthquakes in 2020 and the outbreak of war in the immediate European neighbourhood, all while students were required to fulfil their academic obligations and staff their regular work duties
- strong competitive action by another public university announcing the introduction of an undergraduate program ending with the identical academic title, which represented unfair and non-academic behaviour. The entire case was promptly communicated with the Rector, the Ministry of Science and Education, and the Agency for Science and Higher Education, highlighting numerous procedural irregularities
- elections for the new Rector of the University of Zagreb, activities related to the new Law on Higher Education and Scientific Activity, and the expiration of the existing Collective Agreement for Science and Higher Education
- implementation of the Action Plan in the second re-accreditation cycle, given the Ministry's Letter of Expectation
- introduction of part-time undergraduate and graduate university studies in Environmental Engineering, starting in academic year 2021/2022

May 2023 – Thematic session of the Faculty Council, dedicated to the adoption of the new Statute of the Faculty of Geotechnical Engineering.

July 2023 – Thematic session of the Faculty Council, dedicated to the adoption of the Five-Year Action Plan of the Faculty of Geotechnical Engineering 2023–2027, following the Ministry's Certificate of Compliance for performing higher education and scientific activities.

March 2024 – Extraordinary session of the Faculty Council, dedicated to the Presentation of the Work Programs of the Two Dean Candidates for the Mandate Period 2024/2025–2026/2027:

- Agenda of the dean candidates for academic year 2024/2025, 2025/2026, and 2026/2027.
- secret ballot procedure and decision on the acceptance of a candidate as Dean-elect

RIGHT TO ACCESS INFORMATION

The Faculty of Geotechnical Engineering is subject to the application of the Act on the Right of Access to Information (OG 25/2013, 85/2015, 69/2022). This Act grants all domestic and foreign natural and legal persons, equally and under the same conditions, the right to access information. The Act prescribes the principles of the right of access to information and the reuse of information, the limitations of these rights, as well as the procedure for exercising and protecting the right of access to information and the reuse of information.

The right of access to information is exercised by submitting a request to the Faculty of Geotechnical Engineering. If the request is submitted in writing, it is necessary to complete the Request Form for Access to Information, Request for Supplement/Correction of Information, or Request for Reuse of Information, or, if the form is not used, to explicitly indicate that the information is being requested pursuant to the Act on the Right of Access to Information.

Documents in which the General Data Protection Regulation (GDPR) is implemented include: Employment contracts of staff, Student study contracts, Student consent forms, and Job competition notices.

All information regarding these rights of access to information is available on a dedicated subpage of the Faculty of Geotechnical Engineering website > *Access to Information*. On this page, annual reports on the implementation of the Act on the Right of Access to Information at the Faculty of Geotechnical Engineering are published regularly, at least once a year.

1.4 The higher education institution supports ethics and transparency of work, academic integrity and freedoms, and prevents all forms of unethical behaviour, intolerance and discrimination

The higher education institution continuously promotes, supports, and ensures ethics and transparency of work, academic integrity, and freedom among all stakeholders (in theory and in practice) throughout the entire organization, thereby demonstrating its social responsibility.
The staff of the higher education institution, students, and external stakeholders base their work on the principles of academic ethics.
The higher education institution effectively implements measures to prevent unethical behaviour, intolerance, and discrimination.
The higher education institution carries out activities to sanction unethical behaviour, intolerance, and discrimination, ensuring fair and impartial implementation of procedures for all parties involved.
The system of competences for resolving conflicts and irregularities is clearly defined and functional at all levels of the higher education institution.
The higher education institution encourages research into the causes and consequences of unethical behaviour and the effectiveness of measures taken to prevent it, reports on the research results, and monitors trends.
The higher education institution applies new technologies with the aim of eliminating all forms of unethical behaviour. It systematically addresses issues of plagiarism, cheating, and falsification of results.

ACADEMIC ETHICS

Statute of the Faculty of Geotechnical Engineering (2023), Art. 96, defines the role of the Faculty of Geotechnical Engineering in such a way that it is obliged to preserve, maintain and promote academic ethics – this regulates its importance for the Faculty of Geotechnical Engineering and its employees at the highest formal level.

Members of the academic community base their work and activities on freedom of scientific and artistic creativity, critical discussion, mutual respect, conciliation and a culture of dialogue. In their actions and public appearances, including social networks, they are obliged to adhere to the rules of academic ethics.

Members of the academic community are obliged to protect the dignity and integrity of the University of Zagreb and the Faculty of Geotechnical Engineering, to promote inclusiveness, tolerance, empathy and protection of the weaker and vulnerable. The Faculty of Geotechnical Engineering respects the constitutional principle of inadmissibility of discrimination on the grounds of race, sex, language, religion, political or other belief, national or social origin, property, birth, social position, disability, sexual orientation, age and other forms of discrimination.

Members of the academic community at the University of Zagreb and the Faculty of Geotechnical Engineering are obliged to act in a party-political neutral manner, without emphasizing specific party-political positions.

In order to preserve the dignity and reputation of the University of Zagreb and the Faculty of Geotechnical Engineering, as well as members of the academic community, the Faculty of Geotechnical Engineering monitors and encourages adherence to the rules of academic ethics and academic customs in the conduct of all entities involved in the activities of the University of Zagreb

and the Faculty of Geotechnical Engineering, as a rule by adhering to the Code of Ethics of the University of Zagreb.

CODE OF ETHICS

The Code of Ethics is the fundamental act that regulates the principles of academic ethics. These are not legal provisions and regulations based on pressure and sanctions, but a normative act that represents international values and principles of behaviour in the academic community. The Code of Ethics contains the basic moral principles and principles of professional ethics that teachers, scientists and other employees, as well as students of the Faculty of Geotechnical Engineering, should follow in their professional and public activities. The Code of Ethics of the University of Zagreb regulates the basic ethical principles, ethical principles in science and higher education, the organization and work of the Ethics Committee and the procedure before the Ethics Committee of the Faculty of Geotechnical Engineering.

The Ethics Council of the University of Zagreb coordinates the activities of ethics committees at individual constituents and in order to direct the activities of the University of Zagreb on the improvement of ethical standards, monitors and studies the practice of ethics committees at constituents and decides on the initiation of proceedings in accordance with the Code of Ethics of the University of Zagreb.

In order to effectively implement academic ethics, the Faculty of Geotechnical Engineering does not have its own separate code, but fully adheres to and acts in its work according to the Code of Ethics of the University of Zagreb. In order to establish mechanisms by which the application of the Code of Ethics is supervised, the Ethics Committee of the Faculty of Geotechnical Engineering was established, which is appointed by the Faculty Council on the proposal of the Dean. The Ethics Committee issues opinions on issues of principle as well as on the compliance of conduct in specific cases with the principles and provisions of the Code of Ethics. The Ethics Committee has a president appointed by the Dean from among the members of the committee from among the teachers.

The Ethics Committee of the Faculty of Geotechnical Engineering gives its opinion on the implementation of ethical principles and standards, both in matters of principle and in individual specific cases, and undertakes other actions and performs other activities regulated by the Code. It monitors the application of principles in the field of ethical conduct, conducts the procedure of examining the merits of complaints about unethical behaviour and gives opinions on complaints from employees and students. The Ethics Committee operates in accordance with the Code of Ethics of the University of Zagreb, which describes the structure and work of the Ethics Committee and the procedure before the Ethics Committee.

All information related to ethical issues can also be seen on a separate website of the Faculty of Geotechnical Engineering > Ethics at the Faculty.

- **INITIATION OF PROCEEDINGS AND CONDUCT OF THE ETHICS COMMITTEE**

The procedure before the Ethics Committee is initiated by a request for an opinion on the compliance of a certain action or behaviour with the principles and rules of the Code of Ethics of the University of Zagreb.

A request for an opinion is submitted by the Dean of the Faculty of Geotechnical Engineering on his/her own initiative or at the proposal of other bodies or members of the university community. The request shall be submitted to the President of the Ethics Committee.

If the request for an opinion relates to an opinion on the compliance of the actions or conduct of the Dean or Rector with the principles and rules of the Code of Ethics of the University of Zagreb, the initiator may contact the Faculty Council of the Faculty of Geotechnical Engineering or the Senate of the University of Zagreb, in accordance with the provisions of the Code of Ethics of the University of Zagreb. In justified cases prescribed by the Code of Ethics, any member of the academic community may also contact the Ethics Council of the University of Zagreb directly.

The request for an opinion must be specified and must accurately and precisely describe: the matter of principle in question and/or the specific circumstances of the case and the action or behaviour for compliance with the principles and rules of the Code of Ethics of the University of Zagreb . The Commission may request additional clarifications and notifications from the applicant. If the request asks for an opinion on a specific case, the committee may request comments and clarifications from interested persons. If the applicant seeks an examination of the ethics of the conduct of a particular member of the university community, that member must be given the opportunity to comment on the relevant allegations and present his or her arguments.

The Ethics Committee of the Faculty of Geotechnical Engineering gives its opinion based on the statements and data from the application, annexes to the application and additional clarifications and comments of the applicant and other persons. The Commission does not verify the allegations contained in the requests and statements, nor does it have investigative powers to establish the facts on its own initiative. If the allegations of facts from the request and the allegations of facts from the observations differ, and the veracity of the disputed allegations cannot be inferred from the material submitted in the proceedings, the commission will state this circumstance in its opinion and limit itself to giving a position on the question of principle.

The opinion of the Committee must contain the following information: a description of the request and the issues discussed by the Committee; information on the principles and rules of the Code of Ethics of the University of Zagreb that the Committee took into account on the occasion of the request; the position of the Committee on whether the conduct described in the request is in accordance with the Code of Ethics or not; the reasons for the Committee's opinion; information on whether the opinion was adopted unanimously or not.

In the past five academic years, the Ethics Committee of the Faculty of Geotechnical Engineering has not received a single request for an opinion.

- **STUDENTS AND CODE OF ETHICS**

In order to achieve the goals defined by the Code of Ethics of the University of Zagreb, the Ordinance on Disciplinary Responsibility of Students and Other Students of the Faculty of Geotechnical Engineering was adopted at the level of the Faculty of Geotechnical Engineering.

The Ordinance regulates the procedure for determining violations of obligations of students and other students of the Faculty of Geotechnical Engineering, determines disciplinary acts, jurisdiction for initiating and conducting proceedings, deadlines for the implementation of actions, the conduct of the competent Committee for Disciplinary Proceedings of Students and Other Students, the imposition and execution of disciplinary measures, and regulates other relations arising from the disciplinary responsibility of students/students.

For any breach of obligation, students/students are subject to disciplinary action. Disciplinary offences can be more severe or lighter. One of the following disciplinary measures may be imposed for disciplinary offences: an oral warning, a written warning (publicly announced on a notice board), a ban on taking exams and/or attending certain forms of teaching for up to 6 months, a warning before expulsion from studies, expulsion from studies for up to two years, permanent expulsion from studies.

In the period of academic year 2020/2021 to the academic year 2023/2024, no disciplinary measures were imposed on students.

- **EMPLOYEES AND CODE OF ETHICS**

In order to achieve the goals defined by the Code of Ethics of the University of Zagreb, the employees of the Faculty of Geotechnical Engineering, in addition to the obligation to comply with the provisions of the Code of Ethics, are also subject to the provisions of the Rules of Procedure of the Faculty of Geotechnical Engineering, Articles 109 – 119, which, among other things, very precisely determine: the protection of the dignity of employees from harassment and sexual harassment and their right to respect for the person and protection dignity; prohibition of harassment and sexual harassment; the manner of receiving, acting and resolving complaints related to the protection of dignity; Secrecy of the procedure for the protection of dignity.

Pursuant to Article 120, paragraph 4 of the of the Rules of Procedure of the University of Zagreb Faculty of Geotechnical Engineering (2023), each employee has the right to submit petitions to the Employer on all circumstances that constitute a violation of their rights, dignity, etc., in the procedure prescribed by the Ordinance, the Code of Ethics, the Employer's act regulating disciplinary liability or other special regulation.

In order to create an atmosphere of tolerance, understanding and respect for the dignity of the employee, the Faculty of Geotechnical Engineering shall take special care of informing, raising awareness and sensitizing employees to the issue of dignity protection; Article 117 of the Rules of Procedure of the Faculty of Geotechnical Engineering (2023).

In exercising this right, the Faculty of Geotechnical Engineering should promote relations in the spirit of tolerance, understanding and respect for the dignity of employees. Employees should behave in a business-correct manner without harassment and violation of dignity. Harassment is any behaviour

that aims at or constitutes a violation of the dignity of an employee, and that causes fear or a hostile, humiliating or offensive environment for another employee.

Behaviour that violates the dignity of employees is considered to be intentional or negligent behaviour that includes, for example: gossip, spreading rumours or slander about another, insults, threats, swearing and belittling, sexist behaviour by which people of the other sex or sexual orientation are referred to as socially, inappropriate expressions with the aim of highlighting their sexual characteristics or sexual orientation, making jokes at their expense or trying to make unwanted physical contact, deliberately withholding information necessary for work, providing misinformation and assigning meaningless, unsolvable, disparaging tasks or not assigning tasks.

Pursuant to Article 112, paragraph 1 of the Rules of Procedure of the Faculty of Geotechnical Engineering (2023), the Dean's decision of February 12 2024 appointed a Confidential Advisor, i.e. a person who, in addition to the Dean, is authorized to receive and resolve employee complaints related to the protection of the dignity of employees from harassment and sexual harassment. In the event of unwanted behaviour, an employee who believes that he or she has been harassed may contact the Confidential Advisor or Dean, the head of his/her organizational unit or the trade union commissioner.

During the academic year 2023/2024, one report was received related to harassment and violation of dignity, i.e. the protection of the dignity of employees from harassment. Upon completion of the procedure conducted by the Confidential Counsellor, the harasser was served with a written warning that the reported behaviour constitutes a breach of employment obligations and that it is not acceptable in the academic community, where it is necessary to cultivate mutual respect, appreciation and conduct discussions in a friendly and collegial spirit, and especially to protect weaker and vulnerable groups.

PROTECTION OF PERSONAL DATA

The Faculty of Geotechnical Engineering processes personal data in accordance with the General Data Protection Regulation (GDPR) and in accordance with the Ordinance on the Processing and Protection of Personal Data, with the application of appropriate technical and organizational measures to prevent unauthorized access, misuse, loss or destruction of personal data. Respecting the principle of lawfulness and transparency, personal data is processed based on a legal obligation, contractual relationship, consent or other legal basis. To monitor compliance with the GDPR, a Data Protection Officer has been appointed at the Faculty of Geotechnical Engineering.

The data is collected, used, disclosed or otherwise processed in a transparent manner, and information on the identity of the controller, information on how you can access your data, the process for filing complaints and requests for updating data are made public.

Personal data is collected for specific, explicit and lawful purposes and is not further processed in a way that is incompatible with those purposes. The collected data is only stored when it is necessary for the provision of the service. Data collected for one purpose is not used for any other purpose or in a manner inconsistent with the approved purpose. Personal data is kept within the time limits determined by legal and other regulations, contract or consent.

The data subject is required to consent for the purpose of processing that is not carried out based on a legal basis or a contract. The Controller and the Processor collects the personal data they need for the purpose of the processing. Each data subject has the right to request from the controller at any time access to their personal data, their rectification, deletion or restriction of their processing, as well as the right to object to processing and the right to data portability. These rights are exercised by applying by submitting a personal submission to the registry record of the Faculty of Geotechnical Engineering.

All information about these GDPR rights can also be viewed on a separate website of the Faculty of Geotechnical Engineering > Personal Data Protection.

PROTECTION OF CHILDREN AND MINORS

Pursuant to Article 119. of the Rules of Procedure of the Faculty of Geotechnical Engineering (2023) stipulates that an employee may be prohibited from contacting a child or a minor at the GFV, if it is determined that he or she has been convicted of any of the crimes against sexual freedom, sexual abuse and exploitation of a child.

Given that activities have intensified within the Faculty of Geotechnical Engineering, which include work with minors – primarily elementary and high school students through the activities of the STEM Centre, but also popular science lectures in high schools, etc., during February 2024, employees were asked to submit or sign a statement of no criminal record, so that they could be involved in these activities.

STUDENT OMBUDSMAN

The Student Ombudsperson is elected from among the students of the Faculty. The task of the Student Ombudsperson is to address matters of academic relations and to protect the academic rights and freedoms of students. This function was introduced into the academic community in 2007, with the implementation of the Act on the Student Council and Other Student Organizations.

The Student Council of the Faculty of Geotechnical Engineering appoints the Student Ombudsperson, whose contact information is published on the official website of the Student Council of the Faculty of Geotechnical Engineering.

PLAGIARISM

Any form of plagiarism of papers and ideas is considered a violation of the Code of Ethics of the University of Zagreb. All members of the academic community who participate in scientific research work must guarantee the originality of published scientific papers and the authorship attributed to them, as well as accuracy and honesty in presenting and stating information about the origin of the ideas and citations used in the paper.

It is necessary to protect the right to intellectual property over the results of research and the collected data of all members of the university community.

In order to warn students about the harmfulness of plagiarizing someone else's work, students are assigned seminar papers in various subjects throughout their studies. Papers are written according to strictly defined instructions to teach students how to properly cite authors and cite literature, or how to avoid plagiarism of other works. In the same way, students in their final years of study are prepared to write final, graduate and doctoral theses.

Students enclose a Statement of Academic Integrity and Consent with these papers, thus providing a statement of the originality of the paper and consent for public publication. Before submitting their papers, students are required to use the Instructions for Students related to the verification of the originality of final and graduate papers, according to which they must check the work for originality using the Turnitin software and send the proof of text match to the mentor. The papers are stored in the Digital Repository Dabar. This makes students aware of the lasting heritage of their works and the fact that their work is verifiable and subject to public criticism.

When submitting scientific projects, teachers guarantee the originality of their research, which is also in accordance with the scientific integrity stated in the Code of Ethics of the University of Zagreb. In accordance with the Code, upon publication of the research results, all original data must be available for inspection by authorized persons. To ensure the veracity of the data, it is necessary to document the data sources in detail

- **TURNITIN**

For the needs of higher education institutions of the Republic of Croatia, the Ministry of Science, Education and Youth has provided financial resources for the procurement of software for verifying the authenticity of papers. Proofing software helps to judge the originality of a text by comparing it with several external sources (online sources, scientific and professional articles from selected commercial databases and journals, documents published in open access, a database of papers stored using the selected software) with the possibility of including your own documents. The opinion on whether a certain document contains plagiarized parts is made by the user after analysing the report generated by the software.

From the academic year 2019/2020 until the end of the academic year 2022/2023, the used software was PlagScan (the Faculty of Geotechnical Engineering employed PlagScan). As of the academic year 2023/2024, all public higher education institutions use Turnitin, which, starting from the academic year 2024/2025, also includes an AI-detection add-on. The coordination of procurement as well as the administrative and technical support has been provided by the SRCE – e-Learning Centre.

Users are students and teachers of institutions from the science and higher education system, and they access the software using an electronic identity in the AAI@EduHr system, in accordance with the Instructions for Using the Software.

Turnitn software licenses allow only the verification of student papers (from seminar to final and doctoral papers), and the verification can be performed by teachers and students or non-teaching staff in accordance with the procedures and needs of the Faculty of Geotechnical Engineering. Licenses allow for an unlimited number of checks for each of the enrolled students. Access to the software is provided to all students so that they can independently check their papers.

- **JOURNAL**

The Faculty of Geotechnical Engineering publishes the journal "Environmental Engineering" in which it publishes scientific, professional and other papers in the interdisciplinary field of environmental engineering. Papers are accepted for publication after a positive review.

Ethics in publishing in the journal is a key part of the publishing process and is given special attention. On the journal's website, as well as in the Instructions for Authors, the importance of excluding the possibility of plagiarism is emphasized in such a way that the submission of a paper to the review process implies that the paper has not been previously published and that it is not in the process of being reviewed in another journal. The author is responsible for the content of the paper and for obtaining possible consents related to the publication of individual data.

The post-submission process for each paper (in pre-review) includes Turnitin authentication. This is verified by the editorial board of the journal and the paper is rejected already in the pre-review process, if it results in greater similarity.

INTELLECTUAL PROPERTY

Employees and students of the Faculty of Geotechnical Engineering in scientific and professional research activities and creativity have the right to the protection of intellectual property according to the highest standards, considering the labour law, student status and acts of the University of Zagreb and the Faculty of Geotechnical Engineering.

In particular, this is regulated by the Decision on Intellectual Property Management at the Faculty of Geotechnical Engineering (2024). Employees and students at the University of Zagreb are obliged to respect intellectual property, copyright and related rights.

1.5 The quality assurance system is periodically improved and revised based on the results of the implementation of regular internal and external quality assurance procedures

The higher education institution supports the development of a quality culture that promotes the importance of active participation in internal and external quality assurance processes among all stakeholders of higher education institutions so that they fulfil their purpose, act as a catalyst for change and offer new perspectives to the higher education institution.
The quality assurance system is periodically improved and revised based on the results of the implementation of regular internal and external quality assurance procedures in accordance with ESG, and stakeholders are informed in a timely, clear, accurate and objective manner.
A higher education institution carries out the internal evaluation of the quality assurance system in a cycle that is shorter than the length of the external evaluation cycle.
A higher education institution ensures the competence of internal assessors and encourages them and enables them to acquire the necessary knowledge and skills.
The HEI shall ensure that the preparation for internal and external quality assurance procedures considers the progress made since the last internal and external quality assurance procedures that form a cycle of continuous improvement and contribute to the responsibility of the HEI.
The joint impact that internal and external quality assurance processes have on the development of a higher education institution is analysed and monitored.
Higher education institutions publish clear, accurate, objective, valid and easily accessible information on internal and external evaluation procedures.

QUALITY ASSURANCE SYSTEM

An integral part of the Development Strategy of the Faculty of Geotechnical Engineering is the planning of the quality assurance system, which has been recognized and processed through a separate strategic goal at the Faculty of Geotechnical Engineering: *preservation of existing quality and further promotion and achievement of the highest level of quality in all activities of the Faculty through the implementation of the principles, criteria and methods of quality assurance*.

The Faculty of Geotechnical Engineering, with the help of the Quality Management Committee, uses the quality assurance system and available information systems to collect available data using various methods, process and analyse them. Based on the results of the analyses, the Quality Management Committee plans further activities and improvements, and conducts strategic planning, proposes guidelines and procedures for ensuring and improving quality in all areas of the Faculty's activities.

The Quality Management Committee proposes to the Dean and the Faculty Council specific activities for the purpose of quality assurance and improvement, proposes criteria, standards and procedures for quality monitoring, and prepares and, if necessary, revises the Quality Assurance System Manual. The Management Board and the competent authorities shall make informed decisions based on the proposal. Students and other stakeholders are involved in these processes.

The Quality Management Committee consists of representatives of employees from the ranks of scientific-teaching and teaching positions, of which at least one is a representative of the Management Board (Vice-Dean), a representative of other employees and administrative staff (most often the Secretary of the Faculty), at least one student representative (at the proposal of the Student Council), and from 2018 at least one representative of an external stakeholder (employer). Members of the Management Committee are educated at seminars and workshops organized by the Agency for Science and Higher Education, the Office for Quality Management of the University of Zagreb (URKVA) or the Ministry of Science, Education and Youth.

The Quality Management Committee works in accordance with the Ordinance on the Quality Assurance System of the Faculty of Geotechnical Engineering (2018), which defines in more detail the ways of implementing the quality assurance system, and in accordance with the Quality Assurance Manual of the Faculty of Geotechnical Engineering (2013), which talks about the manner of questioning the success of achieving goals.

From the establishment of the quality assurance system until today, the processes of external and internal evaluation have had a significant impact on the work of the Faculty of Geotechnical Engineering. The Faculty of Geotechnical Engineering has gone through several of them during this period, in such a way as to ensure that when preparing for procedures, the progress made since the last internal and external quality assurance procedures is always considered, in order to create a cycle of continuous improvement and contribution of the higher education institution's accountability.

All data is publicly available at: https://www.gfv.unizg.hr/static/osiguravanje-kvalitete

- **OFFICE FOR QUALITY MANAGEMENT (URKVA-GFV)**

In order to further strengthen the quality assurance system and harmonize its activities with the Act on Quality Assurance in Higher Education and Science, Art. 34 and Art. 114 of the Statute of the Faculty of Geotechnical Engineering (2023) and in accordance with the Instruction of the Quality Management Committee of the University of Zagreb - a new organizational unit has been established at the Faculty of Geotechnical Engineering: the Quality Office (URKVA-GFV). Officially, URKVA-GFV was established at the beginning of 2024 by the Decision on the Establishment of URKVA-GFV.

URKVA-GFV implements a system of internal assurance and improvement of the quality of work of the Faculty of Geotechnical Engineering in accordance with the law that prescribes it, and monitors and improves the quality of work in higher education and science. The core of the quality assurance and improvement system consists of:

- Quality Management Committee – a working body consisting of internal and external stakeholders
- URKVA-GFV – performs professional, administrative and technical tasks related to the quality assurance system
- Faculty Council – Governing Body.

The decision on the appointment of the head of URKVA-GFV and the duration of his/her term of office is made by the Faculty Council on the proposal of the Dean. URKVA-GFV submits an annual report to the Faculty Council. In accordance with the Statute of the Faculty of Geotechnical Engineering (2023), the full scope of work and obligations will be taken over by the URKV-GFV when funds are provided from the State Budget of the Republic of Croatia, and until then the work is performed by the Quality Management Committee.

IMPLEMENTATION OF EXTERNAL PEER REVIEW DURING 2022

During the implementation period of the 2020-2023 Action Plan, The Faculty of Geotechnical Engineering, during 2021, also initiated the external peer evaluation procedure by the Faculty of Geodesy of the University of Zagreb.

For this purpose, representatives of the Faculty of Geodesy of the University of Zagreb, consisting of: Dean Prof. Almin Đapo, PhD, Vice Dean for Science and International Cooperation Prof. Damir Medak, PhD, and Vice Dean for Teaching and Students Assoc. Prof. Ante Marendić, PhD, visited the Faculty of Geotechnical Engineering on 28 October 2022 as part of the External Peer Review of activities implemented in the field of quality assurance in line with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015). A joint Report was drafted on this occasion

Based on what has been seen and based on the previously submitted self-analysis of the quality assurance system of the Faculty of Geotechnical Engineering, the Faculty of Geodesy has issued an Opinion that **the quality assurance system at the Faculty of Geotechnical Engineering is effective**.

The implementation of the external peer evaluation procedure was preceded by:

- Request of the Faculty of Geotechnical Engineering for the implementation of external peer evaluation (Class: 602-04/21-03/01, Reg.No.: 2186-73-01-21-01, 25 February 2021)
- Joint meeting on the topic of defining the plan for the implementation of external peer evaluation at the Faculty of Geotechnical Engineering by the Faculty of Geodesy, University of Zagreb (Class: 602-04/21-03/01, Reg.No.: 2186-73-14-21-2, 15 December 2021)
- submission of the document Self-analysis of the quality assurance system of the Faculty of Geotechnical Engineering, as a prerequisite for the visit of the expert committee of the Faculty of Geotechnical Engineering (Class: 602-04/21-03/01, Reg.No.: 2186-73-01-22-3, 09 September 2022)
- established proposal of the visit protocol (Class: 602-04/21-03/01, Reg.No.: 2186-73-01-22-4, 26 October 2022).

II. STUDY PROGRAMS AND LIFELONG LEARNING PROGRAMS

2.1 The anticipated learning outcomes of the study programme are in accordance with the competencies that the student should acquire upon completion of the study and correspond to the level of the CROQF (ESG 1.2.)

The anticipated learning outcomes of study programmes and all elements of study programmes (courses, modules, exercises, seminars, practice, projects, etc.) are clearly defined and examples of good practice are used to define the envisaged learning outcomes (e.g. ECTS Guide 2015).
The envisaged learning outcomes are in line with the mission and objectives of the higher education institution.
The anticipated learning outcomes of study programmes and all elements of study programmes are mutually harmonized.
The anticipated outcomes are used as a starting point for the development and revision of the study program, the implementation of the study program, and the evaluation and evaluation of student achievement. They are designed to enable unhindered progress of students through their studies.
The anticipated learning outcomes of the study programmes are in accordance with the descriptions of the level of the CROQF and the ECO at which the programme is proposed. The qualifications awarded under the programme are clearly described and presented.
The envisaged learning outcomes of the study programmes clearly reflect the competences needed for inclusion in the labour market, continuation of education or other personal needs of the individual/society.
The anticipated learning outcomes of study programmes are comparable to the anticipated learning outcomes of related programmes in the Republic of Croatia and EU countries.
The envisaged learning outcomes of the study programmes also include the development of generic (general/key/transferable) and professionally specific competencies.
The envisaged learning outcomes of the study programmes also include the strengthening of ethical awareness and the ability to think ethically and apply ethical principles in decision-making related to professional and profession-related issues that occur in a multicultural context.

The Faculty of Geotechnical Engineering of the University of Zagreb has Licenses from the Ministry to carry out three university study programs in the field of technical sciences: undergraduate study of Environmental Engineering (2012), graduate study of Environmental Engineering (2015) and postgraduate doctoral study of Environmental Engineering (2018). In accordance with this, the Faculty of Geotechnical Engineering systematically defines the envisaged learning outcomes at the level of study programmes and all their parts, including individual courses, modules, professional practice, special forms of teaching, seminars and final/graduate theses. The definition of outcomes is based on examples of good practice contained in the ECTS Guide guidelines, using active verbs from Bloom's taxonomy and in accordance with the levels of the Croatian Qualifications Framework (CROQF) so that they clearly indicate the expected levels of knowledge, skills and competencies.

In Table 2.1. The Analytical Contribution to Self-Analysis lists the learning outcomes of study programs that are carried out at the Faculty of Geotechnical Engineering at the undergraduate, graduate and postgraduate levels. The learning outcomes of the study programs of the Faculty of Geotechnical Engineering are based on the principles of excellence and responsibility arising from the mission of the University of Zagreb as the leading academic and scientific institution in the Republic of Croatia. The focus on interdisciplinary education in the field of environmental engineering directly contributes to the development of nationally and strategically important study programs. Such learning outcomes

ensure that students acquire the competencies needed by society and the economy, thus the Faculty responds to one of the key tasks of the University – to act as a driver of technological, economic and social development. By linking scientific research with the teaching process, encouraging academic mobility and recognizing the importance of lifelong learning, the study programs of the Faculty of Geotechnical Engineering contribute to the international recognition of the University and the strengthening of its research and educational role in regional and European frameworks. In addition, by developing professional and ethically based engineering competencies, the Faculty contributes to the formation of experts trained for active and responsible participation in a modern democratic society, thus fully fulfilling the mission of the University of Zagreb.

The learning outcomes of all study programs of the Faculty of Geotechnical Engineering are also aligned with the mission of the Faculty of Geotechnical Engineering, which emphasizes the importance of scientific research and interdisciplinary higher education in the field of environmental engineering based on it. The programs are designed so that students acquire relevant knowledge and practical skills to effectively solve engineering challenges related to waste management, environmental protection, water resources, geotechnics, geoengineering, renewable energy, and the circular economy. Such learning outcomes reflect the strategic commitment of the Faculty to educate professionals who will contribute to sustainable development, environmental protection and strengthening the links between science, economy and the local community by offering engineering solutions to the issues of sectoral pressures and environmental protection in general. In this way, the educational process directly supports the mission of the Faculty and responds to modern social needs and labour market requirements in the field of so-called green jobs.

In the Development Strategy of the Faculty of Geotechnical Engineering 2023–2027. It is stated that the University strives to develop an education that is focused on:

- strengthening interdisciplinary and transdisciplinary approaches in solving environmental problems (Strategic Objective 1.3),
- improvement of scientific research excellence and integration of research into teaching (Strategic Objective 2.1 and 2.2),
- support for lifelong learning and the development of micro-credentials (Strategic Objective 1.5),
- promoting ethics, social responsibility and sustainable development (Strategic Objective 4.3).

All envisaged learning outcomes are designed in accordance with these principles and include both professional and general competencies arising from the strategic guidelines of the Faculty.

Learning outcomes at the course level, with all its parts and activities (seminars, exercises, practical work) are designed to contribute to the achievement of overall outcomes at the level of study programs. There is a clear vertical and horizontal alignment between courses that follows gradual progression (through a system of prerequisites), which allows for the progressive acquisition of knowledge and skills. During the revision of the implementation plans, the consistency of individual and aggregate outcomes shall be considered. As an example of this, an analysis of the content and learning outcomes of individual courses and the methods of teaching (practicum, laboratory and field

exercises) was made by the fields of study of the graduate study program Environmental Engineering. It has been found that technical skills are developed through most of the courses proposed. The following criteria were set for the analysis: learning outcomes that contain technical skills were scored with a maximum of 50%, while the method of teaching that includes practical classes, laboratory exercises, field exercises and seminar papers was scored with a maximum of 50%. According to this analysis methodology, it follows that the contribution to the development of technical competencies in individual fields is: Environmental Geoengineering - 70%, Water Management - 67% and Environmental Management - 63%. The remaining percentage refers predominantly to learning outcomes in the field of legislation and normative acts related to environmental protection, as well as the strengthening of ethical awareness.

For each course at the undergraduate and graduate level, learning outcomes at the program level are defined separately, i.e. learning outcomes to which the course contributes, but also learning outcomes at the course level, which includes specific learning outcomes that students will acquire based on the course content. Also, when proposing new courses in the study program, it is necessary to define the corresponding learning outcomes.

Anticipated learning outcomes are the best indicator of the competencies that students will have upon completion of a particular course or the entire program, so they are used as a starting point for the development and revision of the study program, the implementation of the study program, and the evaluation and evaluation of student achievement. They are designed to enable clear monitoring and evaluation of achievements, which means that to successfully complete a certain course, the student must adopt all the predicted learning outcomes, and the success in the course depends on how he or she came to this.

Learning outcomes form the basis for the design of teaching content, teaching methods and assessment. During the development and revision of the study programme, the outcomes are analysed in detail and, if necessary, updated, considering feedback from teachers, students and stakeholders from practice. Based on the outcomes, criteria for assessment and verification of achievements are formed, which ensures consistency in evaluation and allows students to progressively progress through their studies. This is further facilitated when there is an enrolled qualification standard, because as part of the qualification standard entered in the CROQF register, the conditions for acquiring learning outcomes are also defined; material and personnel conditions necessary for the acquisition and evaluation of learning outcomes, as well as the procedure and examples of the evaluation of learning outcomes.

Learning outcomes are elaborated for each level of study (Table 2.1 of the Analytical Annex) and each program clearly reflects the level of qualification and the corresponding descriptors from the CROQF:

a) Level 6 CROQF – Undergraduate Study: Outcomes include understanding and applying fundamental theories and concepts in the field of environmental engineering, solving standard problems, teamwork, communication and planning.

b) Level 7 CROQF – graduate study: developed more complex analytical, managerial and integrative skills, the ability to independently manage projects, make decisions and manage resources in interdisciplinary contexts.
c) Level 8 CROQF – doctoral study: outcomes include the ability to conduct independent scientific research, develop new knowledge and transfer innovations.

The awarded qualifications are clearly described in publicly available documents and entered in the Register of Study Programmes of the Ministry of Science, Education and Youth. The qualifications that students acquire upon completion of the study programs of the Faculty of Geotechnical Engineering are clearly described and documented through a Diploma and a Diploma Supplement, which is issued to each graduate. The Supplementary document contains structured information on the level, type and content of the qualification, as well as on the academic and professional competences acquired during the studies. Special emphasis is placed on clearly stating the learning outcomes acquired upon completion of the study, especially the main ones at the program level as well as those that are characteristic of a particular field of study. Such an approach ensures transparency and international recognition of the acquired qualification, facilitates the mobility of students and graduates, and enables employers and educational institutions to have a precise understanding of the knowledge, skills and competences that an individual possesses. In addition, the systematic indication of learning outcomes on the Supplement is an example of good practice in documenting educational achievements and clearly communicating qualifications to all relevant stakeholders.

The Faculty of Geotechnical Engineering is among the few constituents of the University of Zagreb that have developed the Occupational Standard of Environmental Engineer and the Qualification Standard of Master of Environmental Engineering, which are registered in the Central Register of the CROQF. The process of developing the standard itself requires the proposer of the standard (in this case, the Faculty of Geotechnical Engineering) to form a group of experts who will propose key jobs, competencies and knowledge and skills necessary for the functioning of the proposed profession in the labour market. The structure of this group is very strictly defined by the Methodology for the Development of Occupational Standards and consists of: representatives of employers who employ the profession; workers in the profession; representatives of the education system participating in education and training for occupations, including mentors at employers where the practical part of the vocational curriculum or professional practice is carried out; an expert from the education and scientific system and a representative of the professional chamber or Occupational Association. All this was respected and visible in the Decision on the appointment of a group of experts for the development of occupational standards. Such a range of personnel ensures that the proposal that is sent for evaluation has a good description of the key tasks that workers in the proposed profession can perform in the workplace and what competencies they need to perform them successfully. The key moment in this is the evaluation of this proposal itself, the process of surveying real employers who give their opinion on how feasible it is in the real sector. The result is the registered occupational standard of environmental engineer in the CROQF register with 10 key jobs for which it is necessary to have 69 competencies, of which 9 are generic (transversal) and 60 are specific. In the second step, when a qualification standard is drawn up based on an occupational standard, it is necessary to link the learning outcomes acquired through that qualification to those competences, so that the link is clear. In the working group that drafted the proposal of the qualification standard at the Faculty of

Geotechnical Engineering, one of the members was the employer who was a member of the working group for the development of occupational standards, so that he could fully follow the development and achievement of the mentioned link. Although the proposal of the qualification standard for the Master of Environmental Engineering was made based on the existing graduate study program, by analysing the specific requirements indicated by employers in the survey process for the development of occupational standards, some parts of this study program need to be revised.

That is why it is important that the learning outcomes adopted by a graduate student in the graduate study of Environmental Engineering must be related to the competencies and knowledge and skills required by the profession of Environmental Engineer and are in line with the needs of the labour market. Based on this, a formal adjustment of the learning outcomes of the graduate study program Environmental Engineering is currently being carried out with the aim of full harmonization with the standards entered in the CROQF register. A Working Group for Amendments to the Graduate Study Program in Environmental Engineering was formed in order to harmonize with the qualification standard, which had several meetings and is currently in the current phase of harmonization of the learning outcomes of the existing study with the mandatory sets of learning outcomes within the enrolled qualification standard. As part of the work of the same working group, an analysis of the actual workload of students in graduate study courses is carried out with the aim of equalizing the number of ECTS credits of each individual course that is still in progress.

The anticipated learning outcomes of the study programs of the Faculty of Geotechnical Engineering clearly reflect the competencies necessary for inclusion in the labour market, continuation of education and satisfaction of wider social and personal needs. Study programmes are designed in accordance with the level and profile of qualifications they acquire, and special attention is paid to the compliance of course content, teaching methods and methods of testing knowledge with the defined learning outcomes.

Learning outcomes include the development of professional and transferable skills such as critical thinking, solving complex engineering problems, an interdisciplinary approach to environmental protection, and the application of legal and ethical principles. Such competences directly correspond to the needs of the labour market, especially in the green jobs sector, thus creating a relevant link between education and employability.

The analysis of re-accreditation of UniZG 2018-2023 constituents recommends that higher education institutions systematically monitor employability (alumni, employers, labour market), adjust enrolment quotas and carry out programme audits based on these results. The Faculty conducts surveys of alumni and consultations with employers, especially those who participate in the process of professional practice, and the obtained insights are important information for the revision of study programs. It was based on these results that the enrolment quota for the undergraduate study of Environmental Engineering was reduced, and part-time undergraduate and graduate studies were introduced. Also, through the systematic implementation of professional practice and field practical exercises in courses, students have the opportunity to apply knowledge in a real work environment during their studies, thus further developing work habits and professional skills. In this way, the Faculty

of Geotechnical Engineering ensures that the envisaged learning outcomes are not only aligned with academic goals, but also with labour market requirements and societal challenges.

The Faculty of Geotechnical Engineering, in cooperation with the Association of Alumni of the Faculty of Geotechnical Engineering AMAC-GFV, occasionally analyses the employment of graduate students. One such very extensive analysis was made as part of the Professional Practice project, when three associations that bring together graduates of the Faculty of Geotechnical Engineering - alumni association AMAC-GFV and two professional associations - the Croatian Society of Geotechnical Engineers (HDIG) and the Croatian Society for Environmental Engineering (HDIO) conducted a survey. The analysis of the employability of GFV students wanted to find out more about the status of graduates of the Environmental Engineering study program in the labour market, and for this purpose, a questionnaire was sent to the graduates in which they were asked the following sets of questions: general data of respondents, data on study at GFV, engagement during studies, satisfaction with studies at GFV, satisfaction with professional practice, first job after graduation, first job, assessment of acquired knowledge at GFV, current position, reasons for unemployment, familiarity with the GFV Alumni Association and the work of the Career Development Centre. Out of 265 graduates to whose e-mail addresses an invitation to fill in the online questionnaire was sent, 145 graduates completed the survey, which makes a response of 54.72% of the total population. The research was presented at a conference as part of the project. A detailed overview of the results of this research can be found HERE. For the purpose of making this Self-Analysis, a new research on the employment of graduates was conducted, which included the research of the last four generations of students who completed undergraduate or graduate studies at the Faculty of Geotechnical Engineering. An e-mail was sent to them with a single question – whether they were employed or not. If they are and want to share information about where they work and how satisfied they are, they can do so. A wide range of feedback was obtained. Out of a total of 65 completed undergraduate students, only 6 of them did not receive data, which is 90.77% of reliable answers, and among them only two declared that they were unemployed. Emphasis is placed on students who have not enrolled in their graduate studies at the Faculty of Geotechnical Engineering, and this is by generation: in 2020/2021, out of 27 students who completed their undergraduate studies, 6 did not continue their studies with us. In 2021/2022, out of 21 completed students, 3 did not enrol in graduate studies at GFV, and in 2022/2023, out of 17 completed, two did not continue their graduate studies in Environmental Engineering. Those who continued their graduate studies at the Faculty of Geotechnical Engineering are included in the following analysis: from 2020/2021 to 2023/2024, a total of 115 students completed graduate studies to whom an inquiry was sent, and only 7 of them did not receive an answer, which is a coverage of 93.91% of reliable answers. Out of 115 of them, only four of them declared that they were unemployed. The overall results of this research were divided into the analysis of the employability of undergraduate and graduate studies. In their answers to the question, they sometimes bring the reactions of their employers regarding the profession.

The Faculty of Geotechnical Engineering uses occupational standards and qualification standards as a basis for future shaping of study programs and learning outcomes. Learning outcomes ensure that students can successfully pursue jobs in the private and public sectors, continue their education, or engage in scientific projects upon graduation. Outcomes are designed to include applicable knowledge, technical and methodological skills, problem-solving skills, critical thinking, and teamwork.

GFV's study programmes, together with the associated learning outcomes, are aimed at addressing real-world environmental challenges, technological developments and labour market needs. Given the multidisciplinary nature of the field of environmental engineering, the competencies that students acquire enable them to be employed in the sectors of environmental protection, water management, geotechnics, spatial planning, industry and public administration. When creating study programs and learning outcomes, the Faculty of Geotechnical Engineering followed examples of related programs from the European Union Member States. Accredited studies in the field of environmental engineering and related technical sciences were considered, thus ensuring compatibility and mutual recognition of qualifications in the European Education Area.

In the development of the undergraduate and graduate study program Environmental Engineering, the role models were primarily the study programs of Environmental Engineering at two well-known European universities: ETH Zürich and Universita di Padova. A comparative analysis of the learning outcomes acquired by students upon completion of the Environmental Engineering program at ETH Zurich and the Faculty of Geotechnical Engineering, University of Zagreb was carried out:

1. Core Focus and Structure: Both programs emphasize an interdisciplinary approach to solving complex environmental problems through the integration of natural, technical, and social sciences. ETH Zürich emphasizes the connection with social and ethical aspects in solving environmental challenges, while the GFV elaborates in detail the outcomes by fields of study, with an emphasis on technical and field application.
2. Level of applicability and skills: At GFV, the outcomes are strongly directed towards the practical application of knowledge (planning, reporting, remediation, GIS analysis, etc.), while ETH emphasizes deeper analytical and modelling processing of the system, including the assessment of model uncertainty, but also the development of new methods.
3. Generic competencies: Both programs develop key generic competencies: teamwork, project management, continuous training, communication with different audiences. ETH further extends this to team management and project management, while GFV puts emphasis on operational applications in specific environmental sectors.
4. Ethics and Sustainability: Both ETH and GFV incorporate ethical principles and sustainability in their outcomes. With ETH, this is more strongly integrated into solution development, while with GFV, ethics and sustainability appear as separate areas within each direction.

A comparison of the learning outcomes of the graduate study of Environmental Engineering at the Faculty of Geotechnical Engineering, University of Zagreb with the Environmental Engineering program at ETH Zurich shows a high level of harmonization in the basic concept, goals and competencies, which confirms that the learning outcomes of the GFV are in line with European practices and standards and enable comparability of qualifications and student mobility.

As for the doctoral study of Environmental Engineering, there are several similar study programs in Europe: in Lithuania (Kaunas University of Technology – PhD Environmental Engineering); in Portugal (Instituto Superior Técnico – PhD Environmental Engineering; University of Porto – PhD Doctoral Programme in Environmental Engineering); in Spain (Universitat Politècnica de Catalunya, BarcelonaTech (UPC) – PhD Environmental Engineering); in Switzerland (École Polytechnique Fédérale

de Lausanne – PhD Civil and Environmental Engineering), in Denmark (Technical University of Denmark – Climate KIC PhD) and several in the United Kingdom (University of Strathclyde − PhD Civil and Environmental Engineering; Cardiff University − PhD Energy and Environmental Engineering; The University of Manchester − PhD Environmental Engineering, University of Edinburgh – Civil and Environmental Engineering). An insight into the existing similar doctoral studies in Europe shows a clear tendency towards interdisciplinarity, much more pronounced than the example at universities in the USA. For example, doctoral studies in environmental engineering at the observed universities (such as the Technical University of Denmark and the University of Edinburgh), extend the classical approach prevailing in the USA (almost exclusively emphasis on water, air and soil protection) to new challenges in which the European Union is a global leader, such as renewable energy sources, circular economy, radiation protection, raw material management engineering, climate change, sustainable development, impact of innovation, recycling. It is interesting to note that these topics mostly appear at smaller and specialized European universities, so, for example, the University of Strathclyde in Glasgow highlights environmental impact assessment, public and environmental health, soil remediation and restoration, water, and the environment, energy and circular economy as the main areas of research.

Through cooperation with stakeholders, work on EU and national projects, organization of professional conferences and consultations, and inclusion of experts from practice in teaching, the Faculty of Geotechnical Engineering actively aligns its educational outcomes with the requirements of employers and the wider community. In addition, micro-credential and lifelong learning programmes are also under development, which also follow the same logic of definition and verification of learning outcomes. In 2024/2025, an online survey of employers who are on the list of the Career Development Centre of the Faculty of Geotechnical Engineering was also conducted, in which they tried to obtain feedback on what knowledge and skills employers need for their employees, and that the Faculty of Geotechnical Engineering can offer them this in the form of a lifelong learning program. In this way, sets of learning outcomes and qualifications would be used to improve the knowledge of employees in the labour market.

In addition to professional-specific learning outcomes, study programs include the development of generic competencies such as communication, teamwork, responsibility, time management, independent learning, IT and digital literacy, problem solving and decision-making. Their development is integrated into the implementation of teaching activities at all levels of study, somewhere more, elsewhere less.

Examples of learning outcomes that develop generic (general/key/transferable) competences at undergraduate level:

- „Collect and store data for the use of geographic information system (GIS)..." - Information literacy, work with digital tools.
- „Assess risk and collaborate in the development of feasibility studies of medium-complex problems..." - Critical thinking, problem solving, teamwork.
- „Prepare and create the technical part of the tender documentation..." - Communication, planning, administrative and organizational skills.

- „Participate in the preparation of the preliminary impact assessment study..." - Interdisciplinary approach, professional responsibility, ability to cooperate.

Examples of learning outcomes that develop professional-specific competences at the undergraduate level:

- „Identify, analyse and solve fewer demanding tasks in the field of environmental engineering." - Basic professional competence in the field of.
- „Make technical drawings, carry out less demanding calculations..." - Engineering technical skills.
- „To sample soils, surface and groundwater in a hazardous or ordinary state." - Field-specific and laboratory-specific methods.
- „To cooperate in the design and execution of works for the exploitation and processing of mineral resources." - Practical expertise specific to geotechnics and environmental protection.
- „Propose mechanical equipment, technological processes and waste treatment procedures..." - Specific knowledge in waste treatment and disposal.

Examples of Graduate Learning Outcomes That Develop Generic (General/Key/Transferable) Competencies:

- „Manage the environment in a sustainable way and take personal and team responsibility for strategic decision-making and successful implementation and execution of tasks." – an outcome that develops responsibility, strategic thinking, teamwork and project management.
- „Participate in the work of teams in the development of river basin management plans and hydrological studies of river basins, organize data on water facilities and phenomena into databases and create a GIS project for the needs of water management." - Encouraging cooperation, data management, application of IT tools.
- „Coordinate interdisciplinary teams in the preparation, implementation and supervision of environmental protection." - Develops communication and organizational skills, working in complex environments.

Examples of learning outcomes that develop professional-specific competencies at the graduate level:

- „Design, plan and perform water exploration works in aquifers..." - Specific technical skills in hydrogeology and engineering practice.
- „Plan, design and recommend the construction and rehabilitation of complex geotechnical structures in the soil..." - Competencies related to the design and execution of geotechnical interventions.
- „Develop a mathematical model of aquifers of intergranular porosity..." - Develops professional competencies in modelling and analysis of environmental systems.

Ethics and sustainability are an integral part of GFV's educational philosophy. Learning outcomes include the promotion of ethical principles in engineering decision-making, academic integrity, environmental protection, and professional responsibility. Through courses and research tasks, awareness of ethical dilemmas and the development of critical thinking in various contexts, including multicultural and global issues, are encouraged.

Examples of such learning outcomes at undergraduate level:

- „Apply the basic principles of environmental protection in accordance with the principles of sustainability and applicable legislation." - Ethical and social responsibility towards the environment is clearly manifested here.
- „Participate in the preparation of the preliminary environmental impact assessment study and respect the legislative and professional framework." - It also includes the ethical component of professional responsibility, as it relates to the consequences of engineering decisions for the environment and society.

Examples at the graduate level:

- „Apply environmental legislation and take social and ethical responsibility for the consequences." - This is a direct example of a learning outcome that includes ethical assessment and professional responsibility.
- „Manage the environment in a sustainable way and take personal and team responsibility for strategic decision-making..." - Emphasis on ethics and sustainability in decision-making, which is important for engineering practice.

Examples at the doctoral level:

- „Apply ethical and professional standards at all stages of the research process.“
- „Critically review the scientific papers of other researchers in accordance with ethical and academic standards.“

In Table 2.2 of the analytical annex to the Self-Analysis, it is evident that the current learning outcomes at the graduate study of Environmental Engineering are well contained in all mandatory sets of learning outcomes for the Qualification Standard of Master of Environmental Engineering, but despite this, the Faculty of Geotechnical Engineering is actively working on changes to the graduate study in order to be fully harmonized with the standard and to take into account the useful advice of employers who were surveyed in the process of drafting occupational standards Environmental engineer.

2.2 The higher education institution has established processes for the planning and development of new and monitoring and periodic revision of existing study programmes. This ensures the modernity of the program and the harmonization of the content of study programs with the latest scientific / professional knowledge

The processes for the development of new and continuous improvement of existing study programmes are clearly defined, involve internal and external stakeholders, are consistently implemented and undergo a formal approval process within the higher education institution.
Key indicators for monitoring the quality of studies are defined, methods of collecting and analysing the necessary information that result in reports with proposals for improving the program. In order to create an effective environment for learning and student support, student workload, progression, pass and completion are evaluated; the effectiveness of student evaluation procedures; students' expectations, needs and satisfaction with the programmes and the learning environment and the expediency of programme support services.
Changes to study programmes have been recorded and current versions of study programmes have been published.
The content of study programmes enables the acquisition of the envisaged learning outcomes.
The content of study programs is in the light of the latest scientific and professional research in the given discipline, which ensures the modernity of the programs, their compliance with the changed needs of society and the needs and expectations of students.
The content of the study programmes enables the acquisition and improvement of digital skills of students where applicable.
The content of study programs ensures horizontal and vertical mobility of students in the national and European education area.
Compliance of ECTS credits with the actual student workload is ensured.

The Faculty of Geotechnical Engineering offers a vertical of study programs in the field of environmental engineering. The undergraduate program without study specializations has existed since 2012, while the graduate program, with three specializations – Environmental Geoengineering, Water Management and Environmental Management, began to be implemented in 2015. During the academic year 2018/2019, the postgraduate doctoral program in Environmental Engineering was launched, while in 2021/2022, the part-time study of the undergraduate and graduate program began. The Faculty of Geotechnical Engineering, University of Zagreb implements clearly defined processes for the development and revision of study programs in accordance with the applicable legislation.

Until the entry into force of the currently valid legislation, higher education institutions functioned in such a way that there were 3 levels of amendments to study programmes:

- Minor changes (up to 20%) – approved by the Faculty Council.
- Major changes (20–40%) – approved by the University Senate.
- Substantive changes and new programmes (>40%) – require an initial accreditation process.

In this case, the ranks of change are defined as (Ordinance, 2010):

Article 18.

Minor changes and additions to the study programme mean changes in the programme implementation plan and substantive changes of up to 20% that do not significantly change the study programme, students' final competencies and their qualifications (professional profile); i.e. courses in the total amount of 80% of ECTS credits of the entire programme must not be changed with regard to the number of ECTS credits and learning outcomes of the courses.

Article 19.

Major amendments (above 20%, but not more than 40%) to the study programme mean amendments to study programmes that significantly change the compulsory courses, i.e. the final competencies of students and their qualifications (professional profile); i.e. courses in the total amount of 60% of ECTS credits of the entire programme must not be changed with regard to the number of ECTS credits and learning outcomes of the courses.

Article 20.

Essential changes and additions to the study program (more than 40%) are those that significantly change the study program. The procedure of substantial amendments to the study programme, which affect more than 40% of the study programme, is carried out with the appropriate application of this Ordinance (Articles 3 to 9), i.e. they are considered a requirement for the evaluation of a new study programme.

However, the permitted changes to the study programme that do not enter into the sum of the percentage of the:

1. change of course holder and course associate,
2. Change the semester in which the course is conducted,
3. Separation of one two-semester into two one-semester courses,
4. merging two one-semester courses into one two-semester course (a valid justification should be provided for this decision, as two-semester courses represent an obstacle to student mobility),"Freezing" of the elective course in the next academic year,
5. Updating the study literature,
6. redistribution of ECTS credits (burden of students with different types of obligations) within the total number in a course,
7. redistribution of the number of teaching hours for different forms of teaching within the number of hours provided for the subject,
8. changes in students' obligations and the way of evaluating the achievement of learning outcomes,
9. improving the record of learning outcomes of individual subjects and learning outcomes at the level of the programme without substantially changing their meaning,
10. the introduction of e-learning in a subject that replaces a maximum of 20% of face-to-face teaching (in which case at least a level of 2)
11. Implementation of a study programme in a foreign language for studies that are accredited in the Croatian language
12. modernization of subjects, which includes the improvement of teaching methods, monitoring of recent literature and student success, and harmonization of content with modern knowledge
13. adjustments to the system of prerequisites necessary for the realization of any of the changes described above, if they do not change the entry competencies for individual courses
14. If the study programme is structured on the system of prerequisites so that all courses are in principle elective, and the system of compulsory and elective courses is switched to the system of compulsory and elective courses so that the courses that were "compulsory" due

to the system of prerequisites, by amendments and amendments are transferred to the category of compulsory courses, this is considered a change in the implementation plan.

In accordance with this, the Faculty of Geotechnical Engineering regularly updated studies and courses with changes related to the improvement of teaching methods, monitoring of recent literature and student success, and harmonization of content with modern knowledge, which were not considered significant changes, but were part of quality assurance. Examples of such modifications are:

- change of course holder (due to retirement, maternity leave, etc.) – the change is recorded in the Study Implementation Plan for the next academic year
- "freezing" of an elective course in the next academic year – due to special circumstances in which an elective course is not taught in a certain academic year (overload of teachers or inability to organize an adequate replacement) – the change is recorded in the Curriculum and the Study Implementation Plan for the next academic year
- updating of study literature - the change is recorded in the Study Performance Plan for the next academic year
- redistribution of the number of teaching hours for different forms of teaching within the number of hours provided for the subject - the change is recorded in the Curriculum and the Study Implementation Plan for the next academic year
- improvement of the recording of learning outcomes of individual subjects and learning outcomes at the level of the program without substantial changes in their meaning – introduction of active verbs from the Bloom taxonomy
- modernization of the course, which includes the improvement of teaching methods, monitoring of recent literature and student success, and harmonization of content with modern knowledge - the change is recorded in the Study Performance Plan for the next academic year
- replacement of elective courses:
    - the course Hydrotechnical Structures II is replaced by Hydropower Facilities – the change is recorded on Form 7 of the UniZG
    - the course Elements of Machines has been replaced by the course Basics of Academic Writing - the change is recorded on the form 7 of the UniZG

In accordance with such regulations and practices, a formal approval process has been developed within the higher education institution. Thus, all minor changes to study programs are initiated by the course holder (unless the need and necessity of introducing changes is indicated at a higher level), who proposes changes and amendments at the meetings of his department. After agreement at the Institute, the proposal comes to the Teaching Committee, and if it is adopted, it must be confirmed by the Faculty Council. If the course has co-holders at different departments and changes are proposed, if the course is an undergraduate study course, it goes for discussion at both departments, and if it is a graduate study course, it goes to the Department that is the holder of the field of study in which the course is being conducted. For courses in the postgraduate doctoral study, amendments are proposed by the course holder directly to the Postgraduate Studies Committee, where they are discussed and approved, and they are also adopted by the Faculty Council.

In order to monitor the status of the implemented changes and additions to study programs, a Working Group (Amendment) was established in 2017, whose task was to record the current state of

changes in study programs in relation to the versions at the time of obtaining the Permits and to point out the needs of formally implemented changes to study programs at the University of Zagreb. The report of the work of this Working Group was presented at the Faculty Council in June 2021 (Minutes, point 8.d) and it was determined that all changes that had been made to that moment in the undergraduate and graduate study program of Environmental Engineering do not enter the overall calculation of changes to the study program ("*After the analysis, the conclusion of the Working Group is that these are minor changes and additions to the study program that are mainly related to changes in the course holder, amendments to the literature and changes in prerequisites*", i.e. it is about modernizing the teaching process in order to maintain the quality of studies), and in order to wait for the formal proposal of the necessary changes to be made and entered in the occupational standard of Environmental Engineer and the corresponding qualification standard, and all changes to the study program should be proposed in a targeted manner in order to harmonize with the real requirements of the labour market, which was thus adopted.

With the entry into force of the new Act on Quality Assurance in Higher Education and Science (OG 151/2022), the Ordinance on the Procedure for the Evaluation of Study Programmes of the University of Zagreb (2024) and the instructions of the Agency for Science and Higher Education (ASHE), the situation has changed. Amendments to study programmes are no longer carried out in three levels, but only in two:

- Initial accreditation of the study – carried out internally by the University of Zagreb, and after the decision of the Senate, the accreditation of the study is taken over by ASHE
- Amendments to Studies – implemented by the University of Zagreb.

The initial accreditation of the study is carried out in the case of:

1. The introduction of a new study
2. Changes in the co-leader of the joint study
3. Changes to the place of conducting the study
4. Changes in the language of the study
5. changes to the academic or professional title acquired upon completion of the study
6. Changes in the way of conducting studies (from classic to online or vice versa)
7. changes in more than one third of the learning outcomes acquired on completion of a study module or studies (substantial content change)

In all other cases, changes and additions to study programmes are made, and the main limit of content changes is one third of all learning outcomes.

Since in March 2023 the Occupational Standard of Environmental Engineer was first entered in the Register of the Croatian Qualifications Framework, and then in July 2024 the Qualification Standard Master of Science in Environmental Engineering, the Faculty of Geotechnical Engineering is making great efforts this academic year to formally align the graduate study program in Environmental Engineering with this qualification standard. For this purpose, a working group (Decision) was formed in December 2024, whose task is to propose amendments to the study program in order to harmonize with the qualification standard Master of Engineering. So far, the working group has held several meetings, initiated discussion activities at the Institutes that are the holders of study specializations in order to define the necessary changes in learning outcomes at the level of majors, and a complete

analysis of the actual student workload for the correction of ECTS credits by individual courses. The work has not been completed, but a proposal for changes to the study program is expected in the near future, which will be sent for formal evaluation, and in this way the graduate study of Environmental Engineering would be formally harmonized with the entered qualification standard.

In addition to this alignment, the Faculty of Geotechnical Engineering has been following the trend of interest in Environmental Engineering study programs for the past few years. Unfortunately, statistics show a constant decline in the number of students at the undergraduate and graduate level in the last seven years, and such a negative trend is a clear indicator of the need for sharp and quick actions in the coming period. For some time now, the Faculty has been planning the development of new study programs Decision for Decarbonization, Decision for Geohazards, and in the coming period these processes will be completed.

The planned activities are fully in line with the defined strategic goals of the Faculty of Geotechnical Engineering in the field of teaching processes, set out in the Development Strategy of the Faculty of Geotechnical Engineering 2023–2027, in particular with regard to the:

- **Objective 1.1:** "Adaptation of existing and development of new study programs, aligned with the needs of employers and the labour market" – the plan for achieving this goal is through the development of a new undergraduate and graduate study program that would closely connect the topic of Environmental Engineering with digital tools and skills (the working title is "Digital Environment") and a professional short study that responds to the expressed needs of the labour market in the field of sectoral pressures and infrastructure and protection environmental.
- **Objective 1.3:** "Improvement of teaching infrastructure and digital capacities" – because new content is planned focused on digital competencies, the use of GIS tools, software solutions, the use of programming and artificial intelligence and e-learning.
- **Objective 1.5:** "Increasing student and teacher mobility" – through planned international cooperation and the conclusion of a Memorandum of Understanding with institutions abroad.
- **Objective 1.6:** "Improvement of existing and development of new programs of lifelong learning, professional development and summer/winter schools" – through the development of short professional programs and modules applicable in formal and non-formal education.
- **Objective 1.2:** "Monitoring and analysis of the success and quality of studies and continuous monitoring of the employability of graduates" – because the development of new programs is based on records of employment of alumni and assessment of market needs.

The Faculty regularly conducts internal assessments of the quality of study programmes through key indicators:

- Graduation and Completion of Students,
- Study Time,
- student workload and compliance of ECTS credits,
- student satisfaction with teaching, programs and support.

Data on pass rates, completion and time of study are collected in the student office and regularly submitted at the request of the competent authorities or serve to draw conclusions on the quality of study or necessary changes. In particular, it is monitored how students of the 1st year of study are doing in the study, at the end of the first semester, the Faculty Council is informed about taking the exam and about possible problems with the report of the Vice-Dean for Education. At the beginning of each academic year, the Vice-Dean for Education informs the Faculty Council with a report on the status of enrolment in all years of study. From time to time, a certain aspect of the study is monitored, which is discussed at the sessions of the Faculty Council. As an example, the Analysis of the dropout rate at the Faculty of Geotechnical Engineering in the period from 2020 to 2022 is cited. Also, an example is the thematic session of the Faculty Council at the beginning of the academic year. As. 2022/2023, which analysed the Perception of the current situation at the Faculty of Geotechnical Engineering by students and employees and discussed the future development of the Faculty of Geotechnical Engineering (Minutes).

Students' opinions are collected through student surveys, with two types of surveys: Teacher Evaluation Surveys and Study Evaluation Surveys as a Whole. Surveys for the evaluation of teachers are conducted by the ISVU Survey on Studomat, on the form defined at the level of the University of Zagreb. In doing so, students evaluate the teacher's:

1. Clearly defines learning outcomes and what it expects from students.
2. Classes are well structured, and the available time is rationally used.
3. Clearly and comprehensibly presents the teaching content.
4. Through the use of different teaching materials, it raises the quality of teaching (e.g. e-learning, pre-prepared materials).
5. Methods, examples and tasks facilitate the achievement of learning outcomes.
6. Has good communication skills and creates a pleasant working atmosphere.
7. He is motivated to work and conscientiously fulfils his duties.
8. Students are treated fairly and with respect
9. Classes are held regularly and on time.
10. What grade would you give to this teacher as a whole?

Also, they can descriptively point out what they particularly liked or what they didn't like. The results of the surveys are available to each teacher through the Teachers' Portal, and the head of the institution (dean) also has access to them, who thus directly monitors and has the opportunity to request changes in the work of individual teachers.

As for the Surveys for the evaluation of studies as a whole, they are filled out by students on paper in the student office after defending their final and graduate theses. In this way, newly graduated students give an assessment and express their (dis)satisfaction with various aspects of studying, including the work of administrative and professional services, the content and implementation of the study program, the ways of evaluating knowledge, the relationship between teachers and students and the general conditions of study. The collected questionnaires are submitted to the Quality Management Office of the University of Zagreb, which analyses the data and submits reports to the Faculty.

Table 1: Results of student surveys related to study programs - content and quality

Studij	PRIJEDIPLOMSKI					DIPLOMSKI				
Pitanje	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Broj anketiranih	50	44	27	21	36	32	39	40	32	26
Sadržaj i kvaliteta obveznih predmeta	4.00	4.16	4.33	4.43	4.33	4.22	4.18	4.65	4.47	4.46
Sadržaj i kvaliteta izbornih predmeta	3.96	4.18	4.33	4.33	4.25	4.00	4.21	4.53	4.44	4.58
Ponuda izbornih predmeta	3.83	4.02	4.15	4.38	4.21	3.90	3.71	4.20	4.16	4.42
Mogućnost pohađanja predmeta koji nisu u sastavu Vašeg studija	3.77	4.03	4.00	3.80	4.12	3.48	3.56	4.24	4.24	4.09
Prilagođenost zahtjeva i težine predmeta predznanjima studenata	3.87	4.19	4.19	4.14	4.5	3.91	4.00	4.34	4.41	4.65
Stupanj u kojemu predmeti na prvoj godini olakšavaju prilagodbu studentima na studij	3.92	4.23	4.15	4.38	4.34	-	-	-	-	-
Povezanost i slijed sadržaja na različitim predmetima i godinama studija	4.00	4.30	4.37	4.33	4.36	4.09	4.18	4.56	4.41	4.69
Stupanj u kojemu je sadržaj studijskog programa zadovoljio Vaša očekivanja	3.93	4.23	4.30	4.38	4.5	4.06	4.21	4.48	4.48	4.65
Ukupno za skup pitanja	**3.91**	**4.17**	**4.23**	**4.27**	**4.33**	**3.96**	**4.01**	**4.43**	**4.37**	**4.79**

The survey specifically evaluates the following in relation to the study programme: the content and quality of compulsory courses; the content and quality of elective courses; the offer of elective courses; the possibility of attending courses that are not part of the study to be attended; the adaptation of the requirements and difficulty of the course to the students' prior knowledge; the degree to which the courses in the first year facilitate the adaptation of students to the study; the connection and sequence of content in different courses and years of study; the degree to which the content of the study programme is program met the expectations of students. By processing the aforementioned surveys in the last 5 academic years in the segment of content and performance of the study program, the results (Table 1) were obtained individually by questions and in total for that segment.

In this way, students can directly influence the pointing out problems and initiating necessary changes in the existing study programs carried out by the Faculty of Geotechnical Engineering.

Changes to study programs have been documented and adopted through the decisions of the Faculty Council. The current versions of all study programmes are publicly available on the Faculty website for the current academic year. The history of changes, together with relevant documents (old curricula and study plans, tables of course changes, descriptions of learning outcomes), is stored and archived in the student office and is available for inspection on request.

Study programs define learning outcomes at the level of courses and the entire program, they are defined on the basis of Bloom's taxonomy, and work is being done on their compliance with the Croatian Qualifications Framework (CROQF). The outcomes are oriented towards the development of

students' professional, analytical and practical skills, where they are regularly analysed and revised to maintain their relevance and feasibility. Details on learning outcomes are provided in Chapter 2.1.

The Faculty continuously monitors scientific and professional trends in the field of geotechnics, water management, waste management, green transition, decarbonization and environmental protection in general. Programs are modernized through:

- introduction of new teaching topics in individual courses in accordance with current challenges, which is adopted through changes to the Study Plans in each academic year,
- integration of the results of scientific projects and international collaborations into the teaching content (e.g. invited lectures, student participation in conferences on climate change adaptation, green infrastructure, renewable energy sources, geohazards…),
- regular renewal of literature and teaching materials (publication of a new university textbook - Strelec, Jug, Grabar (2024): Geotechnical and geophysical field research
- in accordance with the needs of society, new topics such as flood risks in urban areas, earthquake resistance and innovative methods of wastewater and waste gas treatment are also being developed (projects such as UKV, SIGMATOPCRO, OSMI, GUMIIMPEX, WtE, DOK 2020).
- participation in international projects such as "One Sun Connecting North and South" and "Management of urban water resources in Central Europe facing climate change (MAURICE)", HR 01/2018, the results of international research in the field of renewable energy sources, water resources management, environmental protection and waste management are systematically transferred to teaching processes.

In addition, in the academic years 2023/2024, the Faculty began holding popular science events with environmental topics for the general public, and also started with popular lectures in high schools throughout the Republic of Croatia, such as: "The impact of climate change on landslide formation" and "Application of artificial intelligence in environmental engineering and hydrology", in which students also participate.

The Faculty of Geotechnical Engineering publishes the scientific and professional journal Environmental Engineering, which represents the possibility of publishing papers in cooperation with students, and regularly organizes seminars, workshops and round tables that modernize teaching, and at the same time open interesting discussions on the opening of new thematic areas in accordance with social needs. The synergistic effect of these measures ensures that the content of study programs not only follows, but also anticipates changes in science and practice – thus ensuring the relevance, modernity and social applicability of education at the Faculty of Geotechnical Engineering.

Despite this, in the last few years, there has been a continuous decline in the number of students enrolled in the university undergraduate study of Environmental Engineering, so one of the main goals in the coming period is to propose and introduce completely new undergraduate and graduate studies in order to modernize the teaching content and offer attractive topics.

The Faculty of Geotechnical Engineering enables the development of students' digital competencies through a series of curricular embedded content, which rely on modern tools and technologies applicable in geotechnics, engineering geology and environmental protection. Through individual courses at the undergraduate and graduate level, students acquire operational knowledge and skills necessary for modern engineering activities, such as:

- Computer modelling of geotechnical processes (e.g. application of Plaxis software),
- GIS technologies and digital mapping (using QGIS, ArcGIS),
- Modelling of groundwater dynamics (using specialized software Modflow)
- Processing of hydrogeological and environmental data using computer tools,
- CAD tools for engineering design (AutoCAD, Civil 3D)

In addition, in relation to the initial proposal of the graduate study program, three new elective courses have been added to the curriculum that directly contribute to the development of digital skills, namely:

- Digital Platforms in the Environment (elective course in the 1st semester of the graduate study of Environmental Engineering)
- Geodata Databases (elective course in the 3rd semester of the graduate study of Environmental Engineering)
- Computer Practicum II (elective course in the 2nd semester of the graduate study of Environmental Engineering)

In accordance with the recommendations from the Analysis of Re-accreditation of the Constituents of the University of Zagreb 2018–2023., special emphasis is placed on the horizontal introduction of digital content over several years of study, thus avoiding their concentration in individual courses. The Faculty also provides technical infrastructure and teacher training to enable the quality performance of such content, which has been identified as one of the areas of improvement in earlier re-accreditation procedures of other constituents. The new future planned study programmes also further emphasise digital literacy as a core competence, in line with the European Digital Competence Framework (DigComp).

The study programs of the Faculty of Geotechnical Engineering are fully aligned with the Bologna Principles and the ECTS system, which ensures the recognition of qualifications and facilitates academic mobility and transience in the national and European context. Two levels of mobility are possible: horizontal and vertical.

- Horizontal mobility at the national level implies the possibility for students to enrol in certain courses in other studies (study programmes) within the University, which are not carried out in their home study, with the recognition of passed exams and credits earned according to ECTS. This form of mobility represents an important element of modern university education, allowing students to enrich their education and adapt it to their own interests and professional goals, to expand their knowledge and skills, and to better prepare for the challenges of professional life. A properly implemented horizontal mobility system encourages interdisciplinarity, specialization, innovation and flexibility in education,

encourages the acquisition of knowledge in various fields, which increases competitiveness in the labour market and contributes to the quality and attractiveness of university programs. On the website of the Faculty of Geotechnical Engineering, the procedure of horizontal mobility within the national educational area is elaborated.

- International mobility is enabled through the exchange of students and teachers through the Erasmus+, CEEPUS and bilateral agreements, as well as through participation in international schools, workshops and projects. In addition, a wide variety of elective courses are available to students that can be recognized at other higher education institutions, thus encouraging individual study profiling and international compatibility.
- Vertical mobility is ensured through the possibility of continuing education at graduate and postgraduate levels, within the University of Zagreb and beyond, as well as through the recognition of previously acquired competences, including formal, non-formal and informal learning. This aspect is particularly highlighted in the reports of the ASHE expert committees as an important element of the quality and flexibility of studies, with recommendations for a clearer formalisation of recognition procedures.

The faculty systematically publishes information on study programmes, including learning outcomes, ECTS workload and transition conditions, thus supporting transparency and mobility. Also, through a modular approach and the possibility of choosing specializations or elective courses, students are enabled to adapt their educational path to their own interests and professional goals, which is in accordance with ESG standards and guidelines of the Croatian Qualifications Framework. This further strengthens the integration of the Faculty of Geotechnical Engineering into the European higher education area.

The Faculty of Geotechnical Engineering, University of Zagreb is aware of the importance of systematic verification of the compliance of awarded ECTS credits with the actual workload of students, as one of the fundamental principles of the Bologna Process and a prerequisite for transparent and fair evaluation of student work. So far, a comprehensive analysis of the workload by courses has not been carried out, but a significant shift has been achieved by entering the Qualification Standard for the graduate study program Environmental Engineering in the CROQF Register, which has set clear basic parameters for such an analysis. To this end, at the beginning of the work of the working group for amendments to the said study program, it was agreed to carry out an analysis of the student workload as an integral part of the curriculum revision process. As a first step, a detailed questionnaire was created in digital form (Google form), aimed at graduates of the Environmental Engineering study, with the aim of obtaining feedback on the actual time and intellectual engagement needed to fulfil the obligations in the courses, but also on the experiences related to load throughout the semester.

Although student response to the survey is limited so far, which can be partly explained by the complexity of the questionnaire and the time requirements for providing quality and constructive comments, data collection activities are still ongoing. The faculty regularly sends personalized invitations and reminders and plans to further include alumni through institutional channels (e.g. social networks, LinkedIn, professional associations Croatian Society of Geotechnical Engineers (HDIG) and Croatian Society for Environmental Engineering (HDIO) in order to increase the number of relevant responses and ensure the representativeness of the sample. Upon completion of the analysis, the

results will be systematically processed and presented as one of the key inputs in the process of revision of the study program. This will ensure that the allocation of ECTS credits accurately reflects the actual student workload, in line with the principles of fairness, efficiency and transparency. This approach is also aligned with the recommendations from the Analysis of Re-accreditation of Constituents of the University of Zagreb 2018–2023, in which the need for correction of the ECTS workload was recognized as one of the key areas for improving the quality of study programs.

2.3 Student internship is an integral part of study programs, where applicable

Student internship enables the acquisition of practical skills in accordance with the envisaged learning outcomes, where applicable.
Student internships are carried out in a systematic and responsible manner.
Student internships are part of the study programs and are organized outside the higher education institution in cooperation with economy, where applicable.
A higher education institution provides support to supervisors of internships and organizations in which students carry out student internships through orientation and/or training programs for mentoring students in student internship program.
Processes for monitoring and improving the quality of student internships are clearly defined, continuously and involve internal and external stakeholders.
Collected and analysed information is used to promote good practice and initiate activities needed for improvement.

Professional practice is an integral part of the Environmental Engineering study programs at the Faculty of Geotechnical Engineering, and is focused on the practical application of the acquired theoretical knowledge. Students have professional practice at least twice during their studies – first at the undergraduate level when they come into contact with the real labour market for the first time, and then at the end of the graduate study when they have the opportunity to present themselves in the best light to a potential employer before completing their formal education by applying the acquired knowledge.

At the graduate university study, professional practice is carried out from 2015/2016, while in 2021/2022 it was also introduced at the undergraduate level as a compulsory elective course. Practice is thus an integral part of the learning outcomes and in the function of connecting the teaching process with the real work environment. In the graduate study, enrolment is in the 4th semester as a compulsory course in the volume of 160 working hours. By the Ordinance on Professional Practice at the Graduate University Study of the Faculty of Geotechnical Engineering, 5 ECTS credits have been awarded to professional practice. It is enrolled together with the graduate thesis and there are no other classes in that semester precisely so that students can arrange and do an internship at any time during the semester, as well as go abroad for one of the exchange programs (Erasmus+ CEEPUS, etc.). In the undergraduate study of Environmental Engineering, students can enrol in the course Professional Practice 1 as an elective course in the 3rd, 4th, 5th or 6th semester, provided that they must complete it by the end of the undergraduate study. Professional practice 1 has a length of 80 hours and carries 4 ECTS credits.

Clear and measurable learning outcomes are defined for each internship course. At the undergraduate level, students apply the acquired theoretical knowledge in solving engineering tasks, develop responsibility and teamwork, and keep a practice diary. At the graduate level, students are expected to independently solve more complex professional problems, evaluate their own engagement and connect multi-level theoretical knowledge with practice. Through this process, the alignment of practical skills with the intended learning outcomes is ensured.

Learning outcomes for Internship 1 at undergraduate level:

- Apply the theoretical knowledge acquired at the undergraduate study in solving specific engineering tasks
- Apply the skills and professional responsibility necessary to successfully solve work tasks in a real-world environment
- Develop an approach to project work and adapt to working in a team in solving work tasks in a real environment
- Fill out a report and a diary on the completed professional practice

Learning outcomes for Internship 2 at graduate level:

- Combine theoretical knowledge acquired at the graduate study and propose solutions to specific engineering tasks
- Validate the skills and professional responsibility needed to successfully solve work tasks in a real-world environment
- Solve more complex engineering problems independently or in a team
- Fill in a report and diary on the completed professional practice with an emphasis on the assessment and evaluation of the quality of personal engagement during the performance of work tasks during the internship.

Professional practice is carried out according to a clearly defined and publicly available Ordinance on Professional Practice, which determines the rules, procedures and obligations of all stakeholders involved. The system of management and supervision of professional practice has been digitized through the internal application GOSSIP (Main Organizational System of Students and Employers), which ensures transparency and efficiency of the process. GOSSIP is used for:

- connecting students and employers in the application phase,
- booking of professional practice without the need for departures and paperwork,
- complete record keeping of the implementation of the professional practice ,
- evaluation of the quality of professional practice carried out by mentors and students in order to optimize the entire process for all participants.

By creating a profile within the digital platform, employers can highlight their needs, working conditions and benefits, and students can highlight their motivation and skills. Thus, students are able to easily search for employers who take students on internships, obtain information about the jobs that are performed, as well as additional recommendations on the quality of professional internships performed so far with individual employers. If they do not find a suitable employer, students can propose the addition of a new one, and it is approved by the head of professional practice at that level of study.

Students start using the application automatically, by enrolling in the course Professional Practice 1 or Professional Practice 2, while the internship itself is enabled after attending and passing the education on occupational safety organized by the Faculty of Geotechnical Engineering and conducted by VIZOR. Employers start using the application by appointing a contact person who receives the input

information for the application and is in charge of all communication between the faculty, students and the employer itself. In addition to the contact person, the employer is obliged to assign a mentor to each student who is accepted for professional practice who ensures quality performance of professional practice and supervises and guides the student in their work. The mentor must be a highly educated person with experience, willing to engage in the process of transferring knowledge and skills. An employer can have an unlimited number of mentors.

The next step in administrative management is the signing of the Agreement on Cooperation between the employer and the Faculty, which is fully facilitated and digitized within GOSSIP. The cooperation agreement is not a limiting factor in the implementation of professional practice, but it greatly facilitates and ensures it. In addition to the aforementioned Agreement, the application also generates a Referral for Professional Practice upon booking , which is available to both the employer and the student, and is valid without an additional signature. After booking and accepting the internship, both the employer and the student should keep up to date with communication, respond to inquiries, fill in and control the internship diary. In this way, both students and employers will benefit from the internship to the maximum. The practice manager also supervises the entire process and can react in a timely manner if the need arises.

The internship ends with the mentor's confirmation of the records of completed tasks (confirmation of the Internship Diary 1 or 2) and the evaluation of the student's work. After the head of the internship at the faculty confirms that all steps of the internship have been completed correctly, the student receives a Certificate of successful completion of the internship and the student office recognizes the student's corresponding ECTS credits.

A very important segment of the activities of the Faculty of Geotechnical Engineering is professional work, i.e. cooperation with the economy. Professional work is carried out through projects of cooperation with the economy, where faculty employees solve numerous complex problems in the very broad field of environmental engineering. Part of the funds from each professional project is allocated to the improvement of the Faculty's activities (purchase of equipment), material costs of the Faculty, salary supplements for employees who indirectly participate in the realization of these revenues, and part is distributed to the Departments from which the project managers are located. The largest part of the funds is spent on material costs during the execution of projects, payment of external associates, subcontractors, procurement of equipment necessary for the project and salary increases for employees who directly participate in project work teams.

An important aspect of a very fruitful professional cooperation is a large number of companies with which we have long-term quality cooperation. At the beginning of the graduate study program, these companies were asked to accept our students for mandatory professional practice, which is carried out in the fourth semester of graduate study. The largest number of companies have accepted our students, and a certain number of them continue to hire them after graduation. Contact with these companies is very important because of the feedback on students' competencies and the possible need for amendments to study programs in order for our students to be competitive in the labour market.

By participating in projects related to the economy, the researchers of the Faculty gather extensive experience and knowledge. Part of this knowledge and experience is transferred to the teaching process and raises the quality of teaching through the presentation of examples and experiences from professional projects. Also, this transfer of experience and knowledge in the last few years has been directed towards the application of scientific and research projects for domestic and international funds and foundations.

In the graduate study program, professional practice is fully carried out with external partners – employers from the economy and relevant sectors of environmental protection. Students have access to a digital database of employers who have previously expressed interest and signed a Cooperation Agreement with the Faculty. Students can also propose an employer themselves, with the prior approval of the internship manager. In this way, flexibility and accountability in internship planning are promoted. Currently, the GOSSIP system has a database of 75 employers where you can do an internship at either the undergraduate or graduate level, and every year that number is increasing. In the undergraduate study program, students can do their internship not only with external employers, but also in laboratories and workplaces at the Faculty of Geotechnical Engineering, which is used by a certain number of students, while others still go to employers in the real sector.

Employers are in constant contact with the Career Development Centre, which provides them with support in all segments of the implementation of professional practice. Each student must be assigned an internship mentor with relevant professional qualifications at the employer, who supervises the work and provides support during the internship. They are first provided with the Mentoring Guide and Instructions for the use of the GOSSIP system at the beginning of cooperation , which ensures that all mentors are clearly informed about their role and way of working. As part of the Professional Practice project, mentoring workshops were also developed, where all the steps were worked out and practiced on computers in a few hours with mentors and people in charge of the administration of the internship at the employer. However, after the project, the interest waned, so with each new employer, education is done individually through personal contact.

In the period from 2017 to 2022, surveys were regularly conducted on the satisfaction of both students and employers with professional practice. The results of the research pointed to some problems in the implementation of professional practice and also pointed to possible steps forward in the future. Especially valuable were the recommendations of students and employers for the future. The employers recommended improvements in communication and coordination of activities between the Faculty of Geotechnical Engineering and the company, as well as the provision of additional information about students, so that employers could prepare tasks in time in accordance with the interests of students. Simplification of the administrative procedure has also been proposed, such as the introduction of online forms for monitoring the internship process itself and keeping a diary of professional practice.

The students' recommendations were related to the possibility of a greater choice of employers where the internship can be performed, a clearer definition of the process itself and their obligations, and

the need for greater engagement of the head of the internship and the Faculty itself in the organization of the internship.

After the introduction of the internship application, the evaluation of internships is carried out by both students and mentors through structured forms within the GOSSIP system. The professional practice diary is subject to mentor supervision and confirmation of completed tasks, and the final verification is carried out by the head of practice at the Faculty. Feedback is used to analyse and improve the practice system, and also includes the opinions of students, teachers and employers.

The internship evaluation system enables continuous analysis of employers' performance and student satisfaction, which contributes to the expansion of the collaborative network and the promotion of the highest quality internships. Based on the feedback, improvements have already been made, such as the introduction of the GOSSIP platform, the establishment of the Career Development Centre and the introduction of internships at the undergraduate level. The internship manager regularly monitors the quality of the internship and the feedback of both students and employers. Internship managers have the opportunity within the GOSSIP system to mark employers who have particularly distinguished themselves with the quality of their internship (according to student evaluations) and in this way they are additionally singled out to new students who are just looking for employers to do their internship with.

A significant improvement of the internship system was carried out when the conditions were met, mostly thanks to the ESF project UP.03.1.1.04.0059 – "Acquisition of key practical skills in the field of environmental engineering" (2020-2023), within which key tools and structures for the systematic implementation of practice have been developed (GOSSIP, trainings, manuals, Career Development Centre). Currently, the call of the ESF+ fund "Improving employability through professional practice in higher education" has been announced, to which the GFV plans to respond with a project proposal that would be a kind of continuation of the previously mentioned project for further improvement of professional practice by strengthening the capacities and activities of the Career Development Centre and establishing additional cooperation with potential employers who employ our graduate students.

2.4 Quality assurance of lifelong learning programmes is part of the internal quality assurance system of a higher education institution. This ensures that these programmes are up-to-date and in line with current societal needs

The Mission Statement and the Strategic Planning Process are the starting point for the development of lifelong learning programmes that are aligned with them.
The internal quality assurance system of a higher education institution also includes quality assurance processes lifelong learning programmes.
The processes for the development of new and continuous improvement of existing lifelong learning programmes are clearly defined and involve internal and external stakeholders.
The key indicators for monitoring the quality of the implementation of the lifelong learning programme, the methods collecting and analysing the necessary information resulting in reports with suggestions for improvement of the program.
Lifelong learning programmes are aligned with current economic and social needs.

In accordance with the strategic orientations of the University of Zagreb, which in the past year placed special emphasis on the development of the lifelong learning system, the Faculty of Geotechnical Engineering in Varaždin actively follows the guidelines and takes steps to systematically develop and implement lifelong learning programs. In this context, the University has established a number of key elements of the system, including the new Ordinance on Lifelong Learning, the Lifelong Learning Program Database, the Lifelong Learning Working Group, as well as the Lifelong Education Network, which includes all components of the University of Zagreb. These elements form the basis for the institutional and operational implementation of lifelong learning in accordance with current social and economic needs.

Although the Faculty of Geotechnical Engineering currently does not have official, accredited lifelong learning programs registered in the University Database or in the CROQF Register, the Faculty is aware of the importance of this segment and systematically invests efforts in its development. Lifelong learning at GFV has been carried out for years through various forms of education, workshops, summer schools, forums and professional conferences conducted by Faculty employees – both within their own projects and in cooperation with external partners.

Examples of such activities include summer schools for external and internal participants at the Faculty of Geotechnical Engineering:

- Remote Sensing in Environmental Engineering (coordinator: Assist. Prof. Nikola Kranjčić, PhD)
- Basics of Python Programming through Hydrology (coordinator: Karlo Leskovar, PhD)

As for the lifelong learning programs attended by the employees of the Faculty of Geotechnical Engineering, thus upgrading their knowledge and acquiring new skills, it is certainly necessary to mention the education of employees as part of scientific and development projects:

- Within the framework of the OSMI project - use of the Agilent Q-TOF mass spectrometer,
- within the GUMIIMPEX project - work on a gas chromatograph,
- within the project Professional Practice - Use of Microwave Digester and Nitrogen Measuring Device
- education within the project VIRTULAB – Integrated Laboratory for Primary and Secondary Raw Materials

- within the project Professional Practice training for the use of the online platform for the implementation of Professional Practice
- within the OSMI project – use of 3D printers and extruder, 3D modelling and preparation of materials for 3D printer
- education within the HRZZ projects SeisRICHerCRO and SIGMATOPCRO - numerical geotechnical modelling in Plaxis software at a foreign institution - IZIIS, Skopje, North Macedonia
- within the MAURICE project, the use of software for the development of aquifer models and pollution transfer
- within the WtE project – work on a three-axis device.

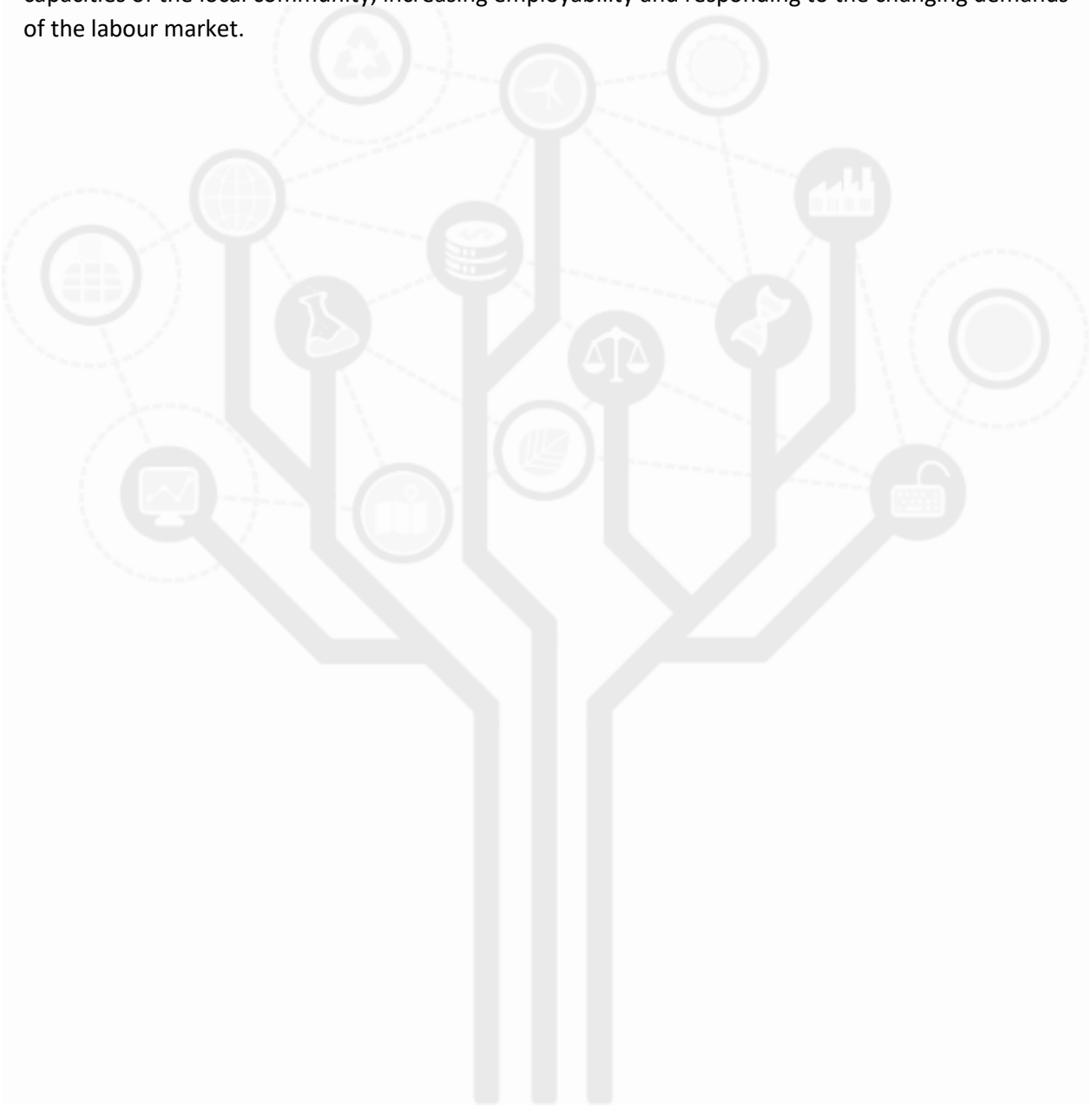
Participation and organization of popular-scientific and professional events such as the Science Festival, University Festival, ARCA Innovation Fair, Open Days of the Faculty of Geotechnical Engineering, Day & Night in Environmental Engineering, Popular Wednesday Events at the Faculty of Geotechnical Engineering, celebration of World Environment Day, World Water Day or Earth Day, in addition to being an opportunity to present the faculty and its activities to schoolchildren and potential students, As part of this, we always try to organize a popular science lecture, workshop or panel discussion through which knowledge is also spread and lifelong learning is promoted among the wider community.

In order to officially establish a system and program of micro-credentials, in September 2024, the Faculty of Geotechnical Engineering adopted the Decision on the method of designing, evaluating and harmonizing programs for achieving sets of learning outcomes (micro-credentials). This Decision defines the procedure for the development and internal evaluation of educational programmes that are aligned with the sets of learning outcomes entered in the CROQF Register, in accordance with the Ordinance of the University of Zagreb, the Statute of the University of Zagreb, the Act on Higher Education and Scientific Activity, the provisions of the Act on the Croatian Qualifications Framework, in accordance with the Instruction of the Ministry of Science and Education for the development, coordination and approval of educational programmes of higher education institutions at the level of higher education for the purpose of financing through vouchers from the National Recovery and Resilience Plan 2021 – 2026 and CES guidelines. The procedure includes the appointment of a working group, program development, internal evaluation, and adoption by the Faculty Council prior to referral to the University. It was agreed that the holders of the development of individual micro-credentials at the level of the Faculty are institutes or the Centre for Research and Student Support (CEPIS). For the development of an individual educational programme, the Dean appoints a Working Group whose task is to develop an educational programme and prepare the necessary Form.

In the previous period, the Faculty has already developed the Occupational Standard of Environmental Engineer and the Qualification Standard of Master of Environmental Engineering, both entered into the Register of the Croatian Qualifications Framework, in the development of which external stakeholders were also involved, which forms the basis for the development of relevant lifelong learning programs. The preparation and establishment of micro-credentials will enable the offer of specific knowledge and skills possessed by the employees of the Faculty of Geotechnical Engineering, which would be interesting and necessary for the general public and adapted to the labour market, and will also enable the use of CES vouchers for education.

The internal quality assurance system of the Faculty includes and plans to integrate the evaluation of lifelong learning programs. It is envisaged to establish a Lifelong Learning Committee, which will take responsibility for evaluating and ensuring the quality of the program, as well as systematic monitoring of the implementation, feedback from participants and their use for the improvement of future programs.

The Faculty of Geotechnical Engineering continues to invest efforts in expanding the offer of lifelong learning, in order to contribute to the professional development of individuals, strengthening the capacities of the local community, increasing employability and responding to the changing demands of the labour market.



III. STUDENT-CENTERED LEARNING AND TEACHING – TEACHING PROCESS AND SUPPORT

3.1 Learning and teaching are student-centred and ensure that all intended learning outcomes are achieved

Study programs and the way they are delivered are designed to encourage motivation, self-reflection and engagement of students in the learning process.
The higher education institution encourages different ways of teaching and the flexible use of different pedagogical methods in accordance with the envisaged learning outcomes.
The use of various pedagogical methods and techniques encourages interactive and exploratory learning, problem-solving, and creative and critical thinking.
Different ways of teaching, pedagogical methods and techniques of working with students are regularly evaluated and adapted in accordance with the results of evaluation.
Teachers regularly carry out processes of reflection on their own teaching practice in order to continuously improve the educational process.
The way of teaching is adapted to the diverse student population (non-traditional student population, part-time students, older students, underrepresented and vulnerable groups, etc.).
A higher education institution ensures the use of advanced technologies with the aim of modernizing teaching and achieving the envisaged learning outcomes.

The Faculty of Geotechnical Engineering of the University of Zagreb systematically develops an educational process in which the student is at the centre of all curricular and extracurricular activities. Such an approach is reflected in the modernization of teaching forms, encouraging active learning and acquiring additional knowledge and skills. The goal is to provide a quality educational experience based on modern pedagogical practices and real needs of the labour market, and to provide support to students in the development of professional and personal competencies. Environmental Engineering study programs at all three levels are designed to connect basic engineering knowledge with current challenges in environmental protection, water management, waste, energy and natural resources. From the first year of study, students are encouraged to actively think about sustainability, climate change, pollution and the preservation of natural systems through interdisciplinary courses and project assignments. The programs provide not only theoretical knowledge, but also real tools for solving specific problems in the community – through laboratory work, field trials, group work and professional practice.

Special emphasis is placed on the development of engineering thinking, where instead of passively observing problems, students are trained to analyse causes and come up with concrete, applicable solutions. In this way, students develop responsibility, professional ethics and a sense of contribution to society, which motivates them to participate in environmental protection projects, professional conferences and activities in the local community outside the classroom. The study programs of the Faculty of Geotechnical Engineering thus educate not only experts, but also active citizens who recognize the challenges of the time, but see them as an opportunity to contribute, and not only a threat.

Adaptation of the teaching process to different student profiles

Considering the fact that students come with different prior knowledge, from the academic year 2017/2018. preparatory courses in Mathematics 1 and Physics 1 are organized at the faculty. From 2020/2021. preparatory courses in Mathematics, Physics and Chemistry were introduced. These

courses are available to students of the 1st year of undergraduate studies at the beginning of the academic year with the aim of equalizing the input knowledge and easier monitoring of the material in regular classes. Such an approach allows students to start their studies more safely and contributes to reducing the number of exam repetitions and early school leaving. As another attempt to increase the pass rate in the Mathematics 1 course, several hours of compulsory repetition have been introduced, which would allow students who did not manage to pass this course in the first year of study to have more opportunities to master the material of the Mathematics 1 course and pass this exam. However, this measure did not come to life among students, they did not use it, so it was abolished. The Faculty of Geotechnical Engineering also strives to ensure flexible changes in the type of teaching (lectures, auditory, laboratory, practicums and field exercises) so that they are combined and adapted in accordance with the nature of the course and learning goals, with the use of multimedia and digital tools. When the need arises or based on student suggestions, the course schedule is adjusted in such a way as to offer effective forms of teaching for the adoption of the set learning outcomes (auditory exercises are exchanged for seminars or classes in computer practicums are introduced), which is especially suitable for the use of specialized software in teaching. Teachers actively apply methods focused on learning through problem solving, case studies, teamwork and project-based learning, which significantly motivates students to actively participate in the teaching process and gain a deeper understanding of professional content.

Students can also acquire certain knowledge and insights at various lectures, forums, workshops and panel discussions organized at the Faculty, where invited lecturers, experts from other faculties, institutions or the economy present, interpret or present topics related to Environmental Engineering or read about it in the media.

The role of e-learning and digital support

The Faculty of Geotechnical Engineering systematically uses the infrastructure for e-learning and digital support for students, which improves the quality of teaching, encourages active learning and ensures better accessibility of teaching content. All this takes place through Merlin, a national e-learning platform enabled by the University Computing Centre (SRCE), which is based on the open source Moodle system. All courses at the undergraduate, graduate and doctoral levels have their own Merlin page. The platform enables the publication of teaching materials, the implementation of interactive tasks and tests, the management of forums, the organization of online consultations and transparent communication about colloquiums, exams and assessments. The system is directly connected to the ISVU system, which enables the automatic opening of courses and the enrolment of teachers and students. In addition to courses from study programs, Merlin enables the opening of additional courses "Staffroom" (for teachers) and "Office" (for students), which serve as platforms for publishing important information and sharing content together. As a complement to the Merlin system, especially in the pandemic period, but also later, the Faculty of Geotechnical Engineering used the Zoom application for video communication and meetings that enable lectures, workshops and meetings to be held in an online environment, and it was especially popular due to its ease of use and wide application in business and educational environments. Now, the MS Teams application is used as part of the MS Office tool.

Students are also provided with access to the Digital Academic Archives and Repositories – DABAR, where all defended final and graduate theses are stored. The Faculty of Geotechnical Engineering has

been participating in the DABAR system from the very beginning of its establishment, and currently the repository contains more than 300 graduate and 350 final theses, with over 60% of papers available in open access. This provides students with research support, encourages the development of academic literacy and ensures the permanent availability of academic production. The role of e-learning at the Faculty is further emphasized through the activities of the Teaching Committee and the Science Committee, which regularly analyse and propose improvements in digital forms of teaching. By using digital tools and platforms, the Faculty of Geotechnical Engineering actively contributes to the modernization of the teaching process, the empowerment of independent and active learning, and the better inclusion of students in the academic community.

Demonstrators, projects and additional work with coordinators

The Faculty continuously encourages the active involvement of students in teaching and professional activities outside the formal curriculum. Every year, through a competition, the best students are selected and confirmed by the Faculty Council to be demonstrators, who, in cooperation with teachers, help their colleagues in acquiring knowledge, performing laboratory exercises, field tests and practical tasks. In addition, interested students are provided with additional work in laboratories, either within scientific projects, or through individual work with mentors on certain topics of special interest, or just by monitoring all extracurricular content, which further develops their research and technical skills. The faculty also provided a volunteering system that was launched through the ESF project STEM Centre for Children and Youth, where student volunteers received certificates of hours spent in volunteer work as leaders of popular science workshops for children of primary and secondary school age.

Field work and participation in professional events

In accordance with the nature of the study programs, field classes are regularly organized, which connect theoretical knowledge with practical experience. Thus, students have the opportunity to visit water structures, mining facilities, sanitary landfills and laboratories of collaborating institutions. Often, in addition to the planned field classes, students are taken to the locations of interesting events in an organized way to experience a special event (tunnel blasting, a visit to the construction site of a wastewater treatment plant, testing of thermo-mineral waters, a visit to plants for the production of energy from renewable energy sources,...) or as part of the field classes, an additional activity is organized that is covered by the media (beach cleaning, waste sorting,...). In addition, students actively participate in domestic and international conferences and professional gatherings, either as participants or just listeners, as part of the teaching process (HUGO, Good Energy, Central Conference on Sustainable Building, Greecajt Festival,...). This further develops their professional culture, communication skills and scientific curiosity.

Fostering excellence and individual approach

Students who achieve above-average results are rewarded with the Dean's Award and recognitions, and also have the opportunity and are encouraged to participate in writing professional and scientific papers together with professors and assistants, competitions and collaborations with partners from the economy. Special emphasis is placed on an individual approach through the consultation system, the availability of teachers via e-mail and platforms, and the support of other services in solving any problems.

Evaluation of the teaching process and student surveys

In order to improve quality, the Faculty regularly conducts an evaluation of the teaching process through student surveys, which collect feedback on the quality of teaching, teachers' approach and course organization. The results of the surveys are available to the teachers themselves, as well as to the dean, who uses them for individual contact with teachers who are needed, to propose specific improvement measures, such as changes in the types of teaching, additional consultation dates or refinement of teaching materials.

Table 2: Results of study evaluation surveys – teaching performance and assessment of knowledge

Study	UNDERGRADUATE					GRADUATE				
Academic Year	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	50	44	27	21	36	32	39	40	32	26
Usefulness of lectures for mastering assigned content	4.02	4.11	4.37	4.19	4.42	4.18	4.03	4.37	4.44	4.54
Practical work in exercises (seminars) and opportunities for active student participation	3.85	3.95	4.33	4.24	4.22	3.97	3.87	4.25	4.28	4.19
Usefulness and quality of teaching materials (literature, scripts, internet, etc.)	4.11	4.23	4.52	4.48	4.53	4.16	4.21	4.55	4.53	4.77
Schedule of classes and obligations within a year	4.13	4.20	4.35	4.33	4.25	4.19	4.21	4.48	4.38	4.77
Organization of professional practice outside the faculty and collaboration with practitioners	3.80	3.93	4.04	4.43	4.35	3.97	3.95	4.29	4.28	4.65
Participation in fieldwork (including summer schools)	3.75	3.79	3.93	4.38	4.29	4.03	4.11	4.42	4.48	4.28
Involvement of students in teaching and scientific projects of teaching staff	3.84	4.00	4.07	4.16	4.41	3.97	3.79	4.16	4.35	4.52
Opportunities for international collaboration	3.95	3.95	4.12	4.39	4.18	3.97	3.82	4.43	4.48	4.13
Clear definition of learning outcomes (knowledge and skills)	3.94	4.05	4.04	4.62	4.48	4.28	4.10	4.55	4.47	4.81
Clearly defined criteria for assessing student knowledge (Clear understanding of requirements for passing)	3.98	4.09	4.22	4.33	4.64	4.19	4.00	4.51	4.50	4.85
Consistency of assessment criteria across courses	3.78	4.05	4.15	4.38	4.39	3.97	3.95	4.41	4.31	4.64
Continuous knowledge assessment during the semester	3.95	4.32	4.19	4.48	4.47	4.23	4.08	4.43	4.44	4.65
Regular and clear feedback on learning progress and exam performance	4.05	4.26	4.42	4.50	4.44	4.31	4.16	4.50	4.47	4.73
Schedule of exam periods and other forms of testing (colloquia, etc.)	3.98	4.07	4.23	4.38	4.50	4.13	4.03	4.39	4.50	4.85
Number of exam periods	4.05	4.23	4.33	4.71	4.67	4.22	4.29	4.53	4.59	4.80
Method of preparing exam questions (types of questions)	3.88	4.19	4.38	4.43	4.42	4.13	4.11	4.43	4.50	4.69
Overall satisfaction with the implementation of the study program	3.98	4.14	4.41	4.48	4.39	4.16	4.03	4.47	4.50	4.77
Total for the set of questions	3.94	4.09	4.24	4.41	4.42	4.12	4.04	4.40	4.44	4.62

In addition to the survey, students can express their opinion through the activities of the Student Council , where they can remain anonymous if they wish. For example, in case of dissatisfaction with the work and/or behaviour of one of the teachers of the Faculty of Geotechnical Engineering, the Student Union may initiate the signing of a petition on the basis of which the Dean is obliged to initiate proceedings at the Ethics Committee and inform the Faculty Council about it. Also, in the lobby of the Faculty, there is a mailbox that is emptied exclusively by the Student Union, and in which each student can leave a message, complaint or problem they are facing, and they want to remain completely anonymous. The President of the Student Union is obliged to forward such reports to the Dean so that he can proceed with the resolution.

In addition to the evaluation of individual courses and teachers, students upon completion of undergraduate and graduate studies also fill out the Survey on the Evaluation of Studies as a Whole, which is currently conducted in paper form, but the University plans to introduce an electronic version in the near future. The faculty has a relatively high student response to this survey, since it takes place live in the student office after the defence of the final or graduate thesis. The collected forms are processed by the Quality Office of the University of Zagreb, after which the results are forwarded to the Faculty, which, among other things, uses them to define enrolment quotas and criteria for enrolment in the graduate study of Environmental Engineering. The third part of this survey deals with the performance of teaching and the evaluation of knowledge. The questions described and the final results can be found in Table 2.

Through systematic monitoring of student feedback, the Faculty of Geotechnical Engineering analyses key aspects of the teaching process at the undergraduate and graduate level of study. The table provides an overview of average grades over a period of five academic years, with a continuous positive trend in almost all observed segments – from the usefulness of lectures and the clarity of learning outcomes to the organization of exam periods and general satisfaction with the performance of the study program. Such results confirm the Faculty's commitment to quality teaching and active improvement of the teaching process based on student experience.

An integral part of the same survey is the part that defines the teacher's attitude towards students during their studies. Since the questions are somewhat different for undergraduate and graduate studies, these tables are separated (Table 3). For the last five years studied, the Faculty of Geotechnical Engineering has received the grades in this area showed in Table 3.

The relationship between faculty and students is one of the key elements of the academic experience. The results for undergraduate and graduate studies in the last five academic years show steady progress and a high degree of student satisfaction. High marks for the accessibility and friendliness of teachers, the quality of consultations and the availability of mentors are particularly highlighted. The increase in grades over time indicates the Faculty's continued efforts to strengthen a pedagogical approach, individualized counselling, and an inclusive academic culture.

In addition to all this, students also have the opportunity to directly influence decision-making and express their views and opinions by participating in the work of the Faculty Council (four representatives), the Teaching Committee (one representative), the Quality Management Committee (one representative), the Library Board (one representative) where they have the opportunity to

express their opinion as well as the opportunity to monitor problem solving and obtain all the necessary information.

Table 3: Results of study evaluation surveys – teacher's attitudes towards students

Study	UNDERGRADUATE				
Academic Year	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	50	44	27	21	36
Encouragement of students to freely express their own opinions during classes	3.93	4.09	4.11	4.48	4.56
Showing understanding for student's problems and obligations outside of study	3.83	3.93	4.11	4.38	4.18
Demonstrating trust in student's abilities and encouraging student self-confidence	3.97	4.02	4.33	4.48	4.25
Accessibility and approachability of teaching staff towards students	4.26	4.32	4.44	4.67	4.56
Impartiality and fairness in relation to students	4.05	4.07	4.22	4.52	4.39
Total for the set of questions	**4.01**	**4.09**	**4.24**	**4.50**	**4.39**

Study	GRADUATE				
Academic Year	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	32	39	40	32	26
Showing understanding for student's problems and obligations outside of study	4.13	4.00	4.53	4.55	4.85
Demonstrating trust in student's abilities and encouraging self-confidence	4.19	4.13	4.55	4.74	4.85
Accessibility and approachability of teaching staff towards students	4.22	4.32	4.55	4.63	4.92
Availability of personal mentors	4.29	4.16	4.58	4.56	4.88
Consultations with teachers and timely teaching assistance	4.38	4.16	4.53	4.65	4.92
Advising students on their future careers (employment)	3.97	3.76	4.50	4.47	4.60
Total for the set of questions	**4.19**	**4.09**	**4.54**	**4.60**	**4.84**

Learning and teaching at the Faculty of Geotechnical Engineering is organized in a way that allows students to acquire knowledge actively, interactively, and effectively. The College continuously:

- ensures accessibility and clarity of content through e-learning,
- develops infrastructure for work in laboratories and in the field,
- encourages self-initiative, excellence and professional engagement of students,
- provides additional forms of support in the form of preparatory courses, demonstration work and mentoring,

and evaluates and improves all this based on feedback and analysis of student results.

In the future, it is planned to additionally introduce modern digital tools (e.g. artificial intelligence in teaching), digitize part of the business, such as the introduction of an application for enrolment, communication with the student office and payment of study costs, as well as the expansion of the range of preparatory content and support for students in the first years of study. This will further strengthen the role of students as active participants in their own education and increase the overall quality of the teaching process.

3.2 Evaluation and assessment are objective and consistent and ensures the achievement of all intended learning outcomes

The criteria and methods of evaluation and evaluation are clear and published before the start of individual courses. Students are familiar with them.
The criteria and methods of evaluation and assessment are aligned with the teaching methods used and the anticipated learning outcomes. They are carried out consistently and objectively. Mechanisms are in place to ensure the objectivity and reliability of evaluation and evaluation.
All those who evaluate students have support in the development of their knowledge and skills related to the methods of evaluation and assessment.
Assessment allows students to demonstrate the extent to which they have achieved the intended learning outcomes.
Students receive feedback on the results of the assessment and, if necessary, advice and/or support in the learning process based on them.
The process of continuous evaluation and monitoring of student achievement enables the identification of students with difficulties in regularly overcoming academic obligations and the provision of timely support and learning assistance.
There is a formally defined appeal procedure that students are familiar with in a timely manner and is consistently implemented.
Assessment procedures consider the specific circumstances of study for individual groups of students (adaptation of examination procedures, for example, for students with disabilities), while ensuring the achievement of the intended learning outcomes.
A higher education institution has an established evaluation and evaluation system that provides information on progress through study and completion of studies at the individual and group level, which is the basis for making decisions on study management.
If possible, the higher education institution carries out an assessment evaluation.

At the Faculty of Geotechnical Engineering, University of Zagreb, the methods of evaluating and evaluating students for each individual course are defined on the basis of the Ordinance on Studying at Undergraduate and Graduate Studies at the Faculty of Geotechnical Engineering , which is harmonized with the new Higher Education and Scientific Activity Act and the new Quality Assurance in Higher Education and Science Act, and The Ordinance on Studying at Undergraduate and Graduate Studies at the University of Zagreb. For each individual course, the methods of evaluation and assessment of students are clearly stated in the Study Implementation Plan, which is adopted before the beginning of the academic year and approved by the Faculty Council. The implementation plan, among other things, contains a list of courses, lecturers and lecturers, forms of teaching, assessment methods harmonized with learning outcomes, the method of taking the exam and assessment criteria. The study plan is published on the Faculty's website and is available to students before the start of classes, as well as the prerequisites for course enrolment and exams.

At the beginning of each course, students are introduced in detail to the learning outcomes, the method of monitoring and evaluating achievements, as well as the assessment criteria. This information is additionally published on the e-learning system (Merlin), which ensures the availability and transparency of the information. This enables students to clearly understand the conditions for acquiring the status of a completed and/or passed course.

Assessment methods (written and oral exams, colloquia, seminar and project papers, assignments and practical exercises) are aligned with the learning outcomes and type of teaching activities. Such an approach allows students multiple opportunities to demonstrate the competencies they have achieved. It also allows students to work continuously throughout the semester and the possibility of

releasing a certain part of the exam before the exam dates. The evaluation is structured and carried out consistently, ensuring the objectivity of the evaluation. Students are provided with an insight into the results of written exams and colloquia, and insight into the oral exam is public.

The Ordinance on Undergraduate and Graduate Studies at the Faculty of Geotechnical Engineering clearly prescribes, among other things, the procedures related to examinations, assessment and appeals (Articles 68–70). The student has the right to see the grade, and if he is dissatisfied, he can file a written complaint within five working days. In this case, the Dean appoints an examination committee that re-evaluates the examination. Such a procedure ensures fairness and a mechanism for the protection of students' rights.

Special attention is paid to students with disabilities and other vulnerable groups. In accordance with the Ordinance (Article 28), adjustments in the manner of teaching and conducting exams are possible – for example, extended writing time, digitized materials or the support of another person, which is in accordance with the University Procedure. The Faculty takes care that such adjustments do not impair the achievement of learning outcomes. For the group of part-time students, who study while working, the dates of written and oral exams are adjusted.

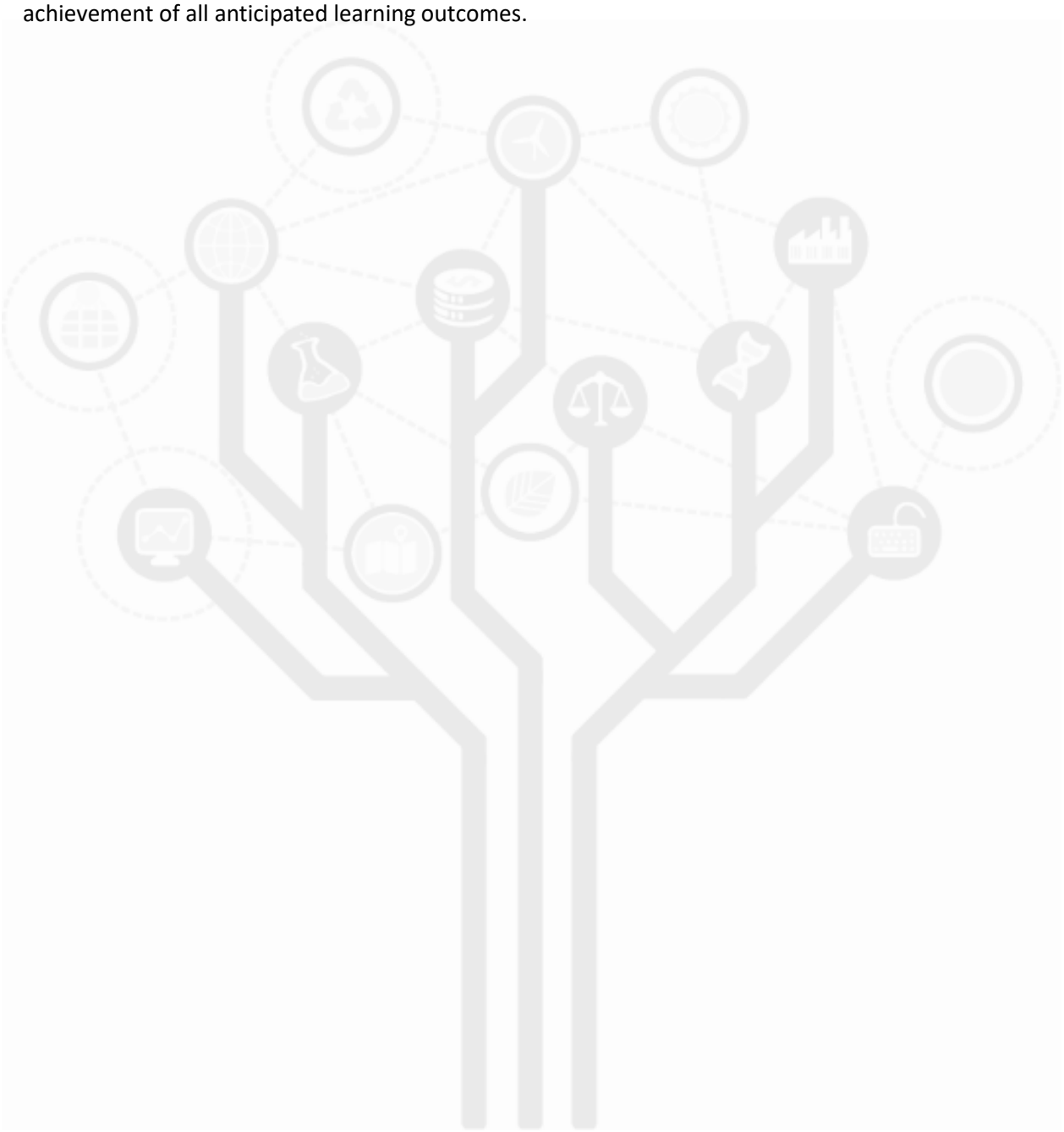
Students complete their studies by preparing and defending their final or graduate thesis, in accordance with the Ordinance on the Completion of Undergraduate or Graduate Studies, with the accompanying Amendments. The topics of final and graduate theses are proposed by the teachers themselves or in agreement with the students, they are then first analysed at the institutes, and then sent to the Teaching Committee for confirmation and adopted by the Faculty Council. When choosing a topic, the student already knows the appointed members of the committee for the evaluation and defence of the thesis, and when enrolling in the Final Thesis or Diploma Thesis course, he/she submits the Request for the Final/Diploma Thesis to the office, and the selected mentor is required to fill out the Final/Graduate Thesis Assignment form, in which the planned outcomes of the work and the time frame for the preparation of the thesis are precisely defined. The terms of the defence of final and graduate theses are adopted by the Teaching Committee, adopted by the Faculty Council and published on Merlin, so that they are known to students before the beginning of the academic year, as well as the Workflow for the preparation of the final/graduate thesis. Support for students is also provided through individual consultations, as well as through the heads of study years at the undergraduate level, who monitor the progress of students and contact teachers in case of difficulties to provide additional assistance.

Progress monitoring and pass analysis is systematically carried out by the student office, and the results are presented in periodic reports that the Vice-Dean for Education presents at the Faculty Council. As far as teaching at the doctoral study is concerned, the report is given by the Head of the doctoral study and presented to the Faculty Council. This document also includes an analysis of student grades and pass rates and serves as a basis for improving studies and the teaching process, as well as for detecting problems encountered.

The Faculty continuously encourages the development of teaching competencies in the field of evaluation, encourages the participation of teachers in trainings organized by the University of Zagreb, the Agency for Higher Education, SRCE or similar institutions, and provides access to manuals and

workshops. Within the institution, the exchange of good practices in assessment is encouraged, especially within the Teaching Committee, one of whose members is a student who regularly conveys the opinion and attitude of students, but also at the Faculty Council, where four student representatives have the full right to participate in all discussions and express their opinions.

The evaluation and assessment system at the Faculty of Geotechnical Engineering is transparent, consistent and tailored to the needs of students, and its purpose is to ensure the quality and achievement of all anticipated learning outcomes.



3.3 The conditions for enrolment and advancement of students, recognition and certification are clear, publicly disclosed and consistently applied

A higher education institution consistently implements pre-established and published regulations that cover all stages of study.
The enrolment policy shall be in line with the national legislative framework, mission and strategy of the higher education institution and shall consider the capacities of the higher education institution and the context in which the higher education institution operates.
The enrolment policy and strategy of attracting students is sensitive to the needs and difficulties of students from vulnerable and underrepresented groups and promotes inclusivity.
Criteria and procedures for the selection and enrolment of students prevent discrimination and bias. They are made public, consistently applied and substantiated.
The criteria and procedures for the selection and enrolment of students ensure the selection of candidates with appropriate prior knowledge, in accordance with the requirements of the study programme.
A higher education institution has adequate procedures in place for the fair recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning, and these procedures are based on the: - compliance of recognition practices at higher education institutions with the principles of the Lisbon Recognition Convention - cooperation with other higher education institutions, quality assurance agencies and national ENIC/NARIC offices
The higher education institution monitors and analyses the progress of students in their studies and ensures the continuity of studies and graduation of students.
Mechanisms have been established that enable the timely identification of students with difficulties in regularly overcoming academic obligations. Timely and continuous support and learning assistance is provided for them.
A higher education institution provides conditions for student mobility in the national and international context.
A higher education institution issues a diploma and a supplementary document of study (free of charge, in Croatian and English) in accordance with the relevant regulations.

The Faculty of Geotechnical Engineering of the University of Zagreb consistently implements pre-established and publicly published regulations that regulate all phases of study, including enrolment, promotion, recognition of prior learning and the issuance of qualifications. These regulations are aligned with the national legislative framework and strategy of the Faculty and the University.

Enrolment Policy and Selection Criteria

The Faculty of Geotechnical Engineering puts a lot of effort into presenting it to potential students who are looking for a place where they will continue their education. Promotional activities at the faculty and popular science lectures in high schools are complemented by the informative web platform "Enrol in Environmental Engineering", which clearly emphasizes the attractiveness of studies, specific career opportunities in utility companies, waste management centres, water purifiers and other "green" sectors. The site emphasizes the practical orientation of the program, including work in modern laboratories and field activities, and recognizes the importance of the living and academic environment in Varaždin, with a showcase of student content, culture, and natural environments that contribute to the quality of student life. Through videos, engagement in summer schools, career days, workshops and visibility on social networks, the faculty not only informs but also tries to actively connect with future students. This comprehensive approach combines content clarity, practical

presentation of the study and a personal impression of the place of study, making the program attractive, relevant and easy to understand for the target groups.

The conditions and criteria for enrolment at all levels of study are clearly defined, publicly available on the Faculty's website for the first year of undergraduate study, for higher years of undergraduate study, and for graduate and doctoral studies published in accordance with the deadlines prescribed by the University of Zagreb. Applications for enrolment in undergraduate studies take place through the National Information System for Applications to Higher Education Institutions (Become a Student), where the criteria for enrolment in the study are published, including the results of the state graduation exam, success in secondary school and the possibilities of direct enrolment in the study. Each potential student applies for the undergraduate level of the study program through the portal of the Central Application Office (SPU). The Central Application Office is the national centre for applications to study programmes or higher education institutions in the Republic of Croatia. SPU combines tasks related to applications for study programs and meeting the conditions for enrolment in higher education institutions.

The Faculty of Geotechnical Engineering regularly makes decisions on enrolment quotas and criteria for enrolment in university undergraduate and graduate studies, submits them to the Senate of the University of Zagreb, on whose website they are published, in accordance with the regulations of the University of Zagreb and the recommendations of the relevant authorities. For the current academic year (as well as the next one), enrolment quotas have been established, by which a total of 90 students are enrolled in the undergraduate study of Environmental Engineering (of which 65 full-time, 20 part-time and 5 foreign students). There is also a special quota for Croats outside the Republic of Croatia and it is 5 students. The enrolment quota is based on the analysis of spatial and personnel resources, valid permits and student assessment through exit surveys. For enrolment in the university undergraduate study of Environmental Engineering, candidates are ranked on the basis of a total of 1000 points, according to their success in high school (up to 500 points) and the result of the state graduation exam in mathematics (basic level) (up to 500 points). There is no special ability test, but for additional achievements (e.g. the first three places in national competitions in relevant STEM fields), the candidate is directly enrolled. From the academic year 2023/2024, direct enrolment is provided to students of selected secondary schools from the territory of the Republic of Croatia that have been granted the right to select their students for direct enrolment in the first year of the university undergraduate study of Environmental Engineering by the Decision of the Faculty Council of the Faculty of Geotechnical Engineering . For candidates from a special quota (Croats outside the Republic of Croatia), grades from general success and key subjects (mathematics, physics, chemistry, biology) are evaluated, and the required level of knowledge of the Croatian language is at least B1 for the first year and B2 for the second year of study.

According to the adopted enrolment quotas, a total of 69 students can enrol in the graduate study of Environmental Engineering (majors: Environmental Geoengineering, Water Management, Environmental Management), of which 45 are full-time students (15 per course), then 15 part-time students (5 per course) and 9 foreign students (3 per field). The right to enrol in the graduate study programme (pp. 43 – 45) is granted to undergraduate students of the Faculty of Geotechnical Engineering and candidates from related university or professional study programmes (technical and natural sciences), with possible differential obligations of up to 15 ECTS (for university programmes)

or up to 60 ECTS (for professional studies, with an average ≥ of 3.51). The criteria include the evaluation of grade point average, duration of study and achievements (e.g. awards), with a possible maximum score of 100 points. Differential exams are defined individually, in accordance with the comparison of previously acquired competencies and the necessary learning outcomes of the graduate program. For part-time students, the achievement of identical learning outcomes is also ensured through separate performance plans.

Decisions on quotas are submitted to the Senate of the University of Zagreb for final adoption, and their preparation also takes into account the recommendations of the Croatian Employment Service related to education policy and the situation on the labour market.

The enrolment policy is aimed at ensuring equal opportunities for all applicants, including members of vulnerable and underrepresented groups. The information is available in an accessible form, and students can also get individual consultations with the Student Office.

Advancement and completion of studies

The criteria for enrolment in higher years of study are prescribed by the Study Regulations, and relate to the number of ECTS credits earned, the conditions for enrolment and taking courses and the time limit for the duration of study. The Faculty of Geotechnical Engineering has a clearly defined system of prerequisites for enrolling in courses and taking exams, which is formalized by the Decision of the Faculty Council and is regularly updated. The prerequisites have been established in order to ensure sequential and pedagogically justified advancement through the study program – students are allowed to enrol or take certain courses only after they have previously passed the prescribed courses from the previous semesters. This ensures that they have the necessary core competencies to successfully follow more complex content and develop higher levels of expertise. A tabular overview of the prerequisites is published and available to students on the website before the beginning of the academic year, as well as on Merlin in the course Office, which ensures the transparency of the study process, and at the same time enables the planning of obligations and rational management of the study load. The system of prerequisites also acts as a quality mechanism, as it enables the consistent application of the principle of progressive acquisition of knowledge in accordance with the level of study and the envisaged learning outcomes. Promotion is also possible in the status of repeated enrolment of the year with restrictions in accordance with the Ordinance. Students are enrolled through the ISVU system, with the support of the Student Office.

The faculty regularly analyses data on passing, finishing and withdrawals. They are prepared by the student office, and the vice-dean for teaching presents them to the Teaching Committee and the Faculty Council. This information is used as a basis for strategic planning, adoption of measures to increase performance and improve study programs (e.g. introduction of preparatory courses in Mathematics, Physics and Chemistry, appointment of teacher leaders in the 1st, 2nd and 3rd year of study, demonstrations from courses that have been identified as those in which students need help, changes to the study plan, etc.).

Recognition of prior learning and mobility

The Faculty of Geotechnical Engineering has developed procedures for the recognition of previous qualifications and previously acquired knowledge in accordance with the Decision. For the recognition

of non-formal and informal learning, the Faculty of Geotechnical Engineering follows the procedures in accordance with the principles of the Lisbon Convention and adheres to the procedures prescribed in the Regulations of the University of Zagreb. The procedures for the recognition of previously acquired knowledge are publicly available and include an individual analysis of the student's request, the opinion of the ECTS coordinator in consultation with the subject teachers, and a decision is issued signed by the Dean with the prior approval of the Vice-Dean for Education. The Faculty cooperates with the national ENIC/NARIC office and the Office for Academic Recognition of the University of Zagreb.

Student mobility is supported through Erasmus+, CEEPUS and other exchange programs, and students are recognized for courses and ECTS credits earned at partner institutions. The faculty has positive examples of student mobility and the inclusion of students from other institutions through transitions and enrolments in higher years.

Student support and progress tracking

The Faculty systematically monitors the progress of students through ISVU, evaluations, regular reports and personal consultations. Students with difficulties in overcoming their obligations can contact the year leaders, the Vice-Dean for Education, students in the Student Union and the Student Office. In addition, the Career Development Centre is available to students, which provides support in skills development and career guidance.

In the case of transfer of students from related studies, in the undergraduate and graduate study of Environmental Engineering, the ECTS coordinator conducts the procedure of recognition of courses and ECTS credits in consultation with the course holders and gives an opinion on recognition approved by the Vice-Dean for Education and the Dean. In the doctoral study, the application for the recognition of previously acquired knowledge is submitted by the doctoral student to the Postgraduate Studies Committee, the analysis of the recognition of previously passed exams is done by the head of the doctoral study, and the decision is issued with the consent of the Dean. This allows you to get involved and progress without unnecessarily repetitive content.

Certification – issuance of diplomas and supplementary documents

The undergraduate and graduate study of Environmental Engineering is completed after the defence of the final and graduate thesis, respectively. Upon completion of the study, the Faculty of Geotechnical Engineering issues a diploma and a supplementary document on study (diploma supplement) in accordance with the applicable regulations. The documents are issued free of charge, in Croatian and English, and are available in digital and printed form.

In accordance with legal obligations, the digital version of the diploma is delivered to students no later than 30 days from the date of graduation, and the printed version no later than 45 days. Students are notified when the printed diplomas are ready for pick-up at the Student Office. If they wish, students can pick up their diploma at a graduation ceremony that is organized once a year.

The diploma contains key information about the holder of the qualification (name and surname, date and place of birth), the level and type of the acquired qualification, the study programme, the academic title, the duration of the study, the date of issue and is certified by the Dean's signature and the official seal of the Faculty.

The Diploma Supplement provides additional information on the:

- Student's personal data and qualifications,
- level, content and results of the study programme,
- grading system and grade point average,
- achieved learning outcomes, competences and employment opportunities,
- information about the final work and possible recognitions,
- Structure and Context of Higher Education in the Republic of Croatia.

This document allows for transparency of qualifications in national and international contexts and facilitates employment or continued education abroad.

The enrolment policy, promotion criteria, recognition and certification systems at the Faculty of Geotechnical Engineering are aligned with the regulations of the University of Zagreb and the legislative framework of the Republic of Croatia. Through all these processes, fairness, transparency, quality and accessibility of higher education to all groups of students are promoted.

Tables 3.1 – 3.4 from the analytical annex show that the Faculty of Geotechnical Engineering continuously monitors key indicators related to studying, including the number of enrolled students, their structure, pass rate, completion and average duration of study. The data from Tables 3.1 and 3.2 indicate a trend of gradual decline in interest in enrolling in the undergraduate study of Environmental Engineering, especially among full-time students, despite a stable enrolment quota and open opportunities for continuing studies. There is also a decrease in the percentage of completion of the compulsory part of the state graduation exam and the average grade of enrolled students, which may indicate broader social dynamics, changes in the perception of the field of study or competition from other related programs. That is why monitoring these indicators enables the Faculty to react in a timely manner through targeted promotional activities, adaptation of program content and strengthening support to students in the early stages of their studies with the aim of increasing the attractiveness of studies and reducing dropouts during their studies.

The data from Table 3.3 shows the interest in the graduate and postgraduate study program Environmental Engineering, and these numbers have also been declining in the last 3 academic years in the graduate study, which is also a consequence of the already commented situation in the undergraduate study. As far as the doctoral study is concerned, the interest is stable and realistically represents the optimal number of candidates in relation to the teaching structure (to maintain the quality of mentoring and research capacities) for successful study and completion of the doctoral study within the deadline.

The analysis of the data from Table 3.4 on student completion shows that most full-time students still complete their studies within the prescribed deadline, i.e. by the end of the third year of undergraduate studies, which indicates a good alignment of the program with the actual workload and support for students in the teaching process. However, there is also a certain retention of some students outside the prescribed deadline, which the Faculty considers when designing counselling and mentoring activities, as well as improving the organization of classes and exam periods. The situation is much better in graduate studies and the majority of enrolled students complete their studies within the deadline.

3.4 A higher education institution provides sufficient and easily accessible resources to support students

A higher education institution provides support to students in their learning and advancement and provides the necessary counselling to ensure an optimal study experience (e.g. tutors, mentors and other counsellors, as well as student services and other appropriate services for student career guidance, psychological counselling, legal counselling, support for students from vulnerable and underrepresented groups, support for students involved in international mobility programmes, library services, etc.) institutional level.
Students are familiar with the different forms of support available to them.
The higher education institution provides support to students to acquire and develop digital skills.
Student support is tailored to a diverse student population (part-time students, older students, students from abroad, students from underrepresented and vulnerable groups, students with certain difficulties in mastering the material and going through the study, etc.).
A higher education institution systematically monitors the various needs of students, especially students from vulnerable and underrepresented groups, ensures study conditions and adapts the ways of teaching and testing knowledge and skills in accordance with their individual needs.
The higher education institution shall employ an adequate number of qualified and dedicated professional, administrative and technical staff.

The Faculty of Geotechnical Engineering, University of Zagreb systematically provides support to students in all aspects of their academic and personal development. Given the smaller number of students compared to larger constituents, the Faculty provides an individualized approach, high availability of teaching and non-teaching staff, and direct and effective communication.

Student support is organized through a number of services and bodies that actively participate in the achievement of a quality student experience: Student Office (undergraduate, graduate and doctoral studies), Secretariat, IT Support Service, Library, Accounting, Career Development Centre (CRK), Centre for Research and Student Support (CEPIS), International Cooperation and Projects Office, Makerspace, as well as the support of the Student Ombudsman.

Since the academic year 2016/2017, the Faculty of Geotechnical Engineering has been operating a management system, the so-called "class management" for students in the undergraduate study program. By the decision of the Faculty Council in September 2017, leaders of individual study years were appointed whose task is to help students in any problems they encounter related to their studies and to monitor the work and achievements of students, react in time if they notice any difficulties. In doing so, care was taken to ensure that the leaders are the teachers that students meet in certain courses in the year they lead, so they are regularly available to students for conversation. Given that the number of students has significantly decreased since then, a new Decision was adopted this academic year, appointing a single head for all three years of undergraduate study, thus achieving continuity of monitoring and support.

From the beginning of the study, students are familiar with the available resources, many of them are presented immediately at the introductory lecture for freshmen, and key information is regularly published through the Merlin e-learning system, on bulletin boards and on the Faculty's website. The Faculty also publishes a Guide for Freshmen, which contains all the relevant information for the beginning of studies. As part of the introductory week, freshmen receive information about the structure of the study, services, rights and possibilities of using support, including information about the newly opened Counselling Centre for Students of the University of Zagreb. Despite the fact that

the Counselling Centre is physically located in Zagreb, the Faculty strongly encourages all students in Varaždin to use this service if they feel the need for psychological support. Mental health problems have been recognized as a key challenge of today, and the Faculty emphasizes the importance of caring for the psychological well-being of students through internal and external communication channels.

In order to strengthen academic and personal support, students have access to teacher consultations that are available on a regular and on-demand basis in additional terms. Furthermore, the faculty has an elaborate demonstrator system. According to the Regulations on Studying at GFV, demonstrators are students who excel in their studies and are able and willing to provide assistance to their fellow students in mastering the material in basic courses and are paid for it. At the Faculty of Geotechnical Engineering, in the courses of the undergraduate study, there are appointed demonstrators from: Mathematics I, Mathematics II, Physics I, Physics II, Descriptive Geometry and Chemistry. Students also develop applied practice and teamwork skills through Makerspace.

The Faculty Library provides support in accessing professional literature and electronic resources, offers reading rooms and assistance in finding the necessary materials for learning, writing seminars, final and graduate theses. They are also enabled to exchange materials inter-library. In addition, computers are available to students for individual work. The work of the library is regulated by the Regulations.

During September 2020, the Decision on the establishment of the Career Development Centre at the Faculty of Geotechnical Engineering was adopted. The Career Development Centre helps students during their studies with career guidance and the achievement of competencies for early career development. The role of the Career Development Centre is also the organization of Career Days, mentoring workshops, administrative monitoring of the implementation of professional practice organized within the Faculty of Geotechnical Engineering, and the like. Through the Centre for Career Development, students are provided with career counselling, networking with employers, preparation for the labour market, resume writing workshops and preparation for job interviews. Once a year, the Career Development Centre of the Faculty of Geotechnical Engineering organizes Career Days in Environmental Engineering, usually at the beginning of December for 5 years in a row. Career Days is a two-day event where students are given the opportunity to get to know renowned companies and institutions in the field of environmental protection and sustainable development; participation in panel discussions and lectures by experts from practice. Also, it is an opportunity for networking, networking and connecting students with potential employers. Workshops on communication skills were also organized, they were given advice on how to create CVs, cover letters and successfully present themselves at interviews. They are also presented with mobility opportunities, either for a teaching exchange abroad or for professional practice. CRK activities also include cooperation with former students (alumni), so that twice at the end of the Career Day, a gala Alumni dinner has been organized as an opportunity for informal socializing of graduates of the Faculty of Geotechnical Engineering, which gives an excellent opportunity to maintain contacts and follow their professional careers. In addition to organizing Career Days, CRK-GFV provides support to students in finding suitable employers for professional practice and supports the development of their professional competencies by offering various workshops and courses that they can do outside the Faculty.

Support is also provided to students from vulnerable and underrepresented groups, including students with disabilities. The Faculty provides spatial and content adjustments in accordance with the needs of individuals, and teachers are instructed to implement adapted forms of testing knowledge and flexibility in teaching. For five years now, every year students have been offered the opportunity to acquire a certain number of ECTS credits by enrolling in the course Peer Support for Students with Disabilities, and support among students is also provided on this side. The faculty also has a designated and disabled student coordinator who provides support to students by solving problems or at least providing useful information.

The IT Support Service actively provides technical assistance to students in the use of digital systems and infrastructure (ISVU, Merlin, Studomat, e-mail, etc.). Students' IT literacy is further developed through SRCE courses, while lectures on the security of using Internet technologies further contribute to their IT security (e.g. trainings led by the IT department manager).).

Table 4: Results of the survey for the evaluation of studies as a whole - the work of administrative and professional services

Question	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	50	44	27	21	36
Work of the student administration office	4.68	4.91	4.93	4.95	4.72
Work of the administrative service (secretariat)	4.5	4.70	4.81	4.75	4.66
Work of the IT support service for students	4.28	4.27	4.6	4.52	4.67
Usefulness of the higher education information system (ISVU)	4.38	4.75	4.74	4.62	4.72
Possibility of access to the ISVU system by students (Studomat number)	4.46	4.80	4.67	4.90	4.67
Usefulness of faculty's webpage	4.2	4.57	4.44	4.48	4.72
Equipment and availability of literature in the library	4.13	4.41	4.76	4.50	4.66
Organization of library work	4.28	4.48	4.69	4.35	4.35
Work of faculty management from a student perspective	4.28	4.58	4.63	4.75	4.67
Work of your study management (department, head, etc.)	4.33	4.64	4.67	4.75	4.76
Total for the set of questions	**4.35**	**4.61**	**4.70**	**4.66**	**4.66**

In addition to academic and professional support, the Faculty of Geotechnical Engineering actively participates in the promotion of student standards through good cooperation with the student union of the Faculty of Geotechnical Engineering, support in the organization of humanitarian, sports and social events, support for student projects by involving students in a wide range of promotional activities and involving students in the work of committees and bodies of the Faculty. The students recognized this effort and rated the work of administrative and professional services with high marks. The results of the survey can be found in the table.

Table 5: Results of the survey for the evaluation of studies as a whole – support in studying

Study	UNDERGRADUATE				
Academic Year	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	50	44	27	21	36
Availability of personal mentors	4.45	4.49	4.37	4.55	4.5
Consultations with teachers and timely teaching assistance	4.18	4.37	4.50	4.60	4.72
Accuracy and timeliness of information on changes in course organization	4.22	4.32	4.23	4.45	4.29
Advising students on strategies for efficient learning	4.00	4.27	4.15	4.48	4.39
Encouraging students to discuss problems in teaching	4.09	4.14	4.19	4.65	4.39
Advising students when choosing courses and on continuing studies	3.91	4.07	4.13	4.33	4.39
Advising students on their future careers (employment)	4.00	4.00	3.96	4.55	4.28
Total for the set of questions	**4.11**	**4.24**	**4.22**	**4.52**	**4.42**

The Faculty continuously takes care of the entire student population (part-time students, employed students, older students, students from other countries) and strives to ensure flexibility, equality and inclusion through all forms of available support. Although the number of students studying at the Faculty of Geotechnical Engineering has been declining in the last few years, this has also contributed to the creation of better relationships between students and teaching, administrative and professional staff. Such relationships are also recognized in the results of student surveys, in which students rate the availability and support they receive highly. In smaller communities, such as ours, it is especially important to create a stimulating and motivating environment in which students know that all forms of support are available to them, that they have different opportunities to engage in additional activities, as well as space for individual work, in accordance with their own interests. Employees in administrative and professional services are continuously improving in their field of activity, and the Faculty encourages their participation in education.

As a constituent of the University of Zagreb, the Faculty of Geotechnical Engineering consistently applies the principles of inclusiveness and accessibility and ensures that all student support resources are functional, accessible, and effective in everyday academic life.

3.5 The higher education institution provides favourable conditions and support to students who are involved in international outgoing and incoming mobility programmes

Domestic students are informed about the possibilities of attending part of their studies abroad.
Through various promotions and information of students and a regulated and flexible way of recognizing ECTS credits acquired during mobility periods, the higher education institution encourages students to participate in outgoing mobility programs.
The University of Applied Sciences provides support to students in the application and implementation of exchange programmes.
A higher education institution ensures the recognition of ECTS credits acquired at another higher education institution.
For foreign students, detailed information on enrolment and study opportunities is available in a foreign language.
The higher education institution is engaged in actively attracting foreign students in order to implement the mobility period and/or enrol in a study programme and obtain a full qualification.
A higher education institution provides support to foreign students when applying, integrating and studying at a domestic higher education institution.
Foreign students have the opportunity to follow classes in a foreign (English) language.
Learning the Croatian language for foreign students is enabled at the institutional level.
A higher education institution collects and analyses feedback on the satisfaction of students involved in outgoing and incoming mobility programmes with the quality of support provided by the higher education institution and actively informs students and other stakeholders about the implemented interventions and improvements.

The Faculty of Geotechnical Engineering of the University of Zagreb is aware of the importance of international mobility in shaping the competencies of its students and strengthening their competitiveness in the European and global labour market. Although the Faculty has signed as many as ten ERASMUS+ agreements and has clearly defined criteria for ranking candidates for academic mobility, in recent years student mobility has not been very pronounced. Nevertheless, all administrative, organisational and information conditions for the inclusion of students and teachers in international exchange programmes are continuously ensured, in particular through the Erasmus+ programme.

The Office for International Cooperation and Projects, which operates within the Faculty of Geotechnical Engineering and provides all the necessary information and counselling to students interested in outgoing and incoming mobility together with the ECTS coordinator, is in charge of coordinating and implementing mobility. The Office cooperates with the International Relations Office of the University of Zagreb, monitors the announcements of competitions, and informs students through websites, bulletin boards, individual consultations and the Merlin system.

Students are regularly provided with information on mobility opportunities, conditions of participation, application procedures, as well as the recognition of ECTS credits and professional practice. On the website of the Faculty of Geotechnical Engineering, basic information is available on how to start research and your own preparation for planned mobility, from the Mobility Manual, related links and the like. Information is also provided individually, in personal communication between students and services, and in providing support to students in choosing foreign institutions, designing motivation letters, CVs, and organizing travel and accommodation. At the already mentioned Career Days in Environmental Engineering, students are always presented with the possibilities of international exchange called ERASMUSiraj se directly through students

representatives of the Erasmus student organization (ESN – Erasmus Student Network Zagreb), who come to share their experiences, show their very attractive promotional video materials from student exchanges and give some advice and motivation.

Students' interest in mobility exists, but in the last few years there has been an increased level of indecision, especially after the pandemic, which poses a challenge in the motivation to actually apply. Although many students express an initial desire, get informed, seem interested, but often in the end the mobility does not come to fruition. Reasons include uncertainty, fear of changing environments, fear about financial conditions or stress related to adapting and studying in a foreign language. The Faculty systematically responds to these challenges with a personal approach, additional information and encouragement, which has already yielded the first results. In the academic year 2021/2022, one student was on an Erasmus+ internship in Ljubljana, and eventually stayed there and worked and continued his education there at the doctoral level. In the academic year 2023./2024. The Faculty of Geotechnical Engineering has received an invitation to participate in a summer school organized by the Faculty for Water Sciences, Ludovika University of Public Service, Baja, Hungary for students from the region/Danube basin. Three students of our faculty were approved to participate in this summer school for 5 days. And although it is not a classic mobility, such international collaborations help students gain international experience and provide additional motivation for students to get involved in other programs.

In the academic year 2024/2025, interest in mobility has increased, as many as three students have applied for the Erasmus+ competition for professional practice abroad. Also, one student of the Faculty of Geotechnical Engineering is currently on mobility in Taiwan, where she is doing professional practice and working on her graduate thesis, and we also have one incoming mobility from Macedonia for doctoral studies, as part of which the doctoral student is doing research with us for the preparation of her doctoral thesis, and the defence of her doctoral dissertation is scheduled for September 15, 2025. This confirms that the students of the Faculty of Geotechnical Engineering are particularly suited to forms of professional practice through mobility and forms for conducting individual research, which is in accordance with the orientation of study programs towards applied and practical knowledge in the field of environmental engineering. For students on incoming mobility, it is possible to learn foreign languages through the UNIC program. Foreign students can also learn Croatian through the Croaticum Centre, as can be seen from the notice on the website of the University of Zagreb.

In addition to the Erasmus+ program, other forms of international cooperation are also available to students, such as IAESTE exchanges, bilateral scholarships and competitions from various international organizations. The faculty actively informs students about these opportunities as well.

In terms of incoming mobility, the Faculty of Geotechnical Engineering has received several inquiries from foreign students for the next academic year, and currently one student from Spain has been confirmed to come for a study stay through the Erasmus+ program. The Faculty provides support to incoming students in the form of information in English, teaching materials, support from ECTS coordinators, as well as contact with other students for easier integration.

Support for students also includes assistance in choosing a course, agreeing on the recognition of learning outcomes, and counselling on adjusting the study plan. The Faculty strives to further develop

incoming mobility through active promotion, the creation of promotional materials in English and the expansion of the offer of courses available to foreign students.

In addition to developing awareness of the importance of mobility among students, in the future it is planned to further strengthen the support system, better visibility of opportunities on the Faculty's website, as well as the inclusion of students who have already participated in mobility in promotion through experiential workshops and info days. Although the Faculty of Geotechnical Engineering has so far tried to financially support all forms of international mobility, in the coming period it is planned to formalize it even better in order to at least reduce this type of uncertainty a little. The Decision on Encouraging Student Mobility , which has been in force since 2012, established the obligation of the student to hold a 30-minute presentation for other students of the Faculty of Geotechnical Engineering upon returning from mobility, which was regularly held and will continue to be such a practice.

The Faculty of Geotechnical Engineering will continue to strengthen cooperation with foreign institutions, participate in mobility programs and develop institutional conditions so that international exchange becomes an integral part of the student experience.

IV. TEACHING CAPACITIES AND INFRASTRUCTURE OF HIGHER EDUCATION INSTITUTION

4.1 The higher education institution provides favourable conditions and support to students who are involved in international outgoing and incoming mobility programmes

A higher education institution has an appropriate number of full-time teachers employed in a full-time scientific-teaching or artistic-teaching position (for a university or constituent unit) with an appropriate number of teachers selected in the field in which the study is carried out (university 21 teachers, of which at least three in the field; faculty or academy of arts seven teachers, of which at least three in the field).
The ratio of the total number of enrolled full-time students and teachers to title teachers is not more than 30:1 (when calculating the ratio, the share of working time of teachers who are employed part-time is added to the full-time work of one teacher).
The total annual teaching load of all teachers does not exceed 20% of the total annual teaching load (in the case of a public higher education institution).
The total annual teaching load of an individual teacher does not exceed 20% of the total annual teaching load.
The workload of teachers ensures an even distribution of teaching obligations, scientific/artistic work, professional and personal development, and administrative obligations.
All teachers, including external associates, are and are qualified for the courses they teach, have relevant work experience and include the latest trends and knowledge from the labour market in the teaching process.
*__Teachers__ – persons employed at a higher education institution in scientific-teaching and artistic-teaching positions, i.e. teaching positions.

According to the Ordinance on the Internal Organization and Systematization of Jobs of the GFV, tasks related to certain positions are prescribed. Employees in scientific-teaching positions (full professor in permanent election, full professor, associate professor, assistant professor) teach at all levels of study, participate in examining and mentoring students and continuously improve their scientific and professional development. They are actively involved in scientific research and professional work, the development of teaching materials and programs, the organization of practice and field teaching, as well as reviewing and editorial activities. They participate in the work of scientific and professional associations, the promotion of the Faculty and in the work of bodies and committees within the institution. They also perform other professional tasks in accordance with the needs of the Faculty and the instructions of their superiors.

Employees in teaching positions (senior lecturer, lecturer) are primarily focused on conducting undergraduate and graduate teaching, holding exercises, exams and consultations. They also participate in the writing of teaching materials, the organization of field classes, professional and promotional activities and, if necessary, in the work of faculty bodies. They are also expected to undergo continuous professional development and publish papers, as well as to participate in professional activities for the market that the Faculty conducts.

Employment is carried out in accordance with the needs of teaching and the strategic goals of the Faculty, after discussion at the departments, the Dean's Collegium and the Faculty Council, and in accordance with the prescribed procedure. A Human Resources Management Plan is being developed and approved by the Senate of the University of Zagreb. The consent of the University of Zagreb and

the competent Ministry is required. All tenders shall be made public, as well as the results of tender procedures.

In the academic year 2023/2024, teaching at the undergraduate, graduate, and doctoral levels at the Faculty of Geotechnical Engineering was carried out by 31 full-time faculty members (27 holding scientific-teaching titles, 2 senior lecturers, and 2 lecturers), 1 senior assistant and 2 assistants.

Out of this number, 8 faculty members were elected in the scientific field of Interdisciplinary Technical Sciences, within which the study programs of Environmental Engineering are conducted.

At the undergraduate and graduate levels of the Faculty's study programs, 11 external associates were involved in accordance with the Teaching Implementation Plans of the Environmental Engineering program, covering various aspects of the curriculum (lectures, seminars, fieldwork, practical and tutorial exercises). External associates in the academic year 2023/2024 included: Assoc. Prof. Darko Pavlović, PhD (Plinacro), Assist. Prof. Branko Ančić, PhD (Institute for Social Research), Assist. Prof. Siniša Širac, PhD (Hrvatske vode), Assistant Tanja Šikić, PhD (Institute for Water "Josip Juraj Strossmayer"), Prof. Jasna Hrenović, PhD (Department of Biology, Faculty of Science, University of Zagreb), Assoc. Prof. Aleksandra Perčin, PhD (Faculty of Agriculture, University of Zagreb), Professional Associate Janko Gušić (Music School Varaždin), Assoc. Prof. Vesna Poslončec-Petrić, PhD (Faculty of Geodesy, University of Zagreb), Assoc. Prof. Sanja Tišma, PhD (Institute for Development and International Relations), Assist. Prof. Kosta Urumović, PhD (Croatian Geological Survey), and Darko Barbalić, PhD (Hrvatske vode).

At the doctoral level, teaching in the academic year 2023/2024 was delivered by four external associates: Prof. Goran Klobučar, PhD (Department of Biology, Faculty of Science, University of Zagreb), Assoc. Prof. Rene Lisac, PhD (Faculty of Architecture, University of Zagreb), Assoc. Prof. Mario Šiljeg, PhD (Institute for Water "Josip Juraj Strossmayer") and Assoc. Prof. Tea Žakula, PhD (Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb).

The involvement of external associates from various scientific and professional institutions proves to be extremely important for improving the quality of the teaching process. Associates come from a number of relevant institutions – from university constituents (Faculty of Science, Faculty of Agriculture, Faculty of Geodesy, Faculty of Architecture and Faculty of Mechanical Engineering and Naval Architecture) and scientific institutes (Institute for Social Research, Josip Juraj Strossmayer Water Institute, Croatian Geological Institute, Institute for Development and International Relations) to public companies (Croatian Waters, Plinacro). Each of them provides students with specific professional knowledge, scientific insights and rich personal experience from practice, which complements the existing teaching structure of the Faculty in segments where it is not sufficiently represented. This approach enriches the study program and contributes to its constant development and alignment with the needs of the labour market and contemporary challenges in the field of environmental engineering.

In the undergraduate study of Environmental Engineering, teaching is largely covered by its own staff (except for lectures in the course Geodesy, lectures in the elective course Sociology and the Environment, and Exercise), and the scientific and teaching staff holds 65.86% of classes. In the graduate study of Environmental Engineering, due to the larger offer of specific elective courses, several external associates were hired (for the courses: Wastewater Treatment, Groundwater

Dynamics and Modelling, Regulations, Land Reclamation, Geostrategic Resources and Water Energy Systems, Project Management in Water Management, Environmental Microbiology and Soil Protection and Remediation), but the coverage of teaching by its own scientific and teaching staff is 78.83%. In the academic year 2023/2024, 5 new doctoral students were enrolled in the doctoral study, and since teaching is only in the 1st year of study, and that year classes took place from 16 enrolled courses (out of a total of 42 that are offered), the coverage of teaching by its own scientific and teaching staff was 72.88%.

In the academic year 2023/2024, 111 full-time and 24 part-time students studied at the faculty. According to the structure of employees who participate in classes, the ratio is 3.54 students for each teacher.

As far as the teaching workload of teachers is concerned, the distribution of working time is defined in the Collective Agreement for Science and Higher Education (OG 9/2019), which in Article 67, paragraph 1. 1 prescribes: "the total fund of working time in scientific and teaching positions consists of an average of 45% for teaching, 45% for science and 10% for institutional contribution". However, Article 70 defines flexible frameworks for acceptable distributions: teaching between 27% – 63%, and science also 27% – 63%, while for the institutional contribution it remains up to 10%. Even Article 71 prescribes a possible temporary deviation from such distribution, with justified reasons (projects, needs of the program), but this must apply occasionally, for individuals, and not for the entire collective. It is also ensured that everyone must achieve at least 45% for science in a five-year period, with compensation if they had a higher teaching load. According to these regulations, and considering the teaching obligations at undergraduate and graduate studies, teachers have a sufficient workload, no teacher exceeds 20% of the total teaching load in any study program individually, as well as collectively, and the distribution of working time is within the prescribed limits.

4.2 The recruitment, promotion and re-election of teachers are based on objective and transparent procedures that include the evaluation of excellence

The HEI has developed and regularly updates its staff recruitment policy and plan to ensure adequate teaching capacity. The entire process of attracting, applying selection methods, selection and recruitment, as well as the development and promotion of teaching staff is based on professional, objective and transparent procedures and criteria that promote excellence and are consistently applied.
Teacher recruitment procedures stem from the development goals of higher education institutions and are aligned with positive legal regulations and internal acts.
When selecting, appointing and evaluating teachers, their previous activities are considered (teaching activity, research activity, feedback from students, etc.).
A higher education institution has appropriate methods of selecting the best candidates for each position and, in addition to the prescribed national minimum requirements for each position, it has prescribed competitive criteria to select excellence.
Procedures for the promotion of teachers to higher titles are based on the evaluation and rewarding of excellence and consider important achievements (e.g. international contribution to the discipline, prestigious publications, significant scientific discoveries, successfully completed projects, successfully secured additional funds, mentoring, supervising final and graduate theses, scripts, textbooks, popular lectures, etc.).
Indicators of excellence include scientific, teaching and professional work and contribution to the development of higher education institutions.
Additional criteria for the promotion of teachers to higher titles reflect the strategic objectives of the higher education institution.

Given that the consent of the University of Zagreb is required for the selection procedures for a vacant position and a higher position, the Faculty of Geotechnical Engineering regularly collects and processes data on teachers, their teaching workload and scientific and professional competencies. The Faculty keeps records of deadlines for promotion, as well as the total coefficients of employees, which serve as a basis for planning possible new jobs. All relevant data are consolidated in the Human Resources Management Plan, which is prepared for the current academic year and includes a projection of needs for a period of five years in advance. Recruitment and promotion procedures are based on the provisions of the Higher Education and Scientific Activity Act, the Collective Agreement for Science and Higher Education, the Basic Collective Agreement for Employees in Public Services, the Statute of the University of Zagreb and the Statute of the Faculty of Geotechnical Engineering.

Described procedure of employment and promotion to a higher position:

> The University of Zagreb and the Ministry of Science, Education and Youth issue a consent for announcing a vacancy notice at the Faculty of Geotechnical Engineering, i.e. for initiating the selection procedure for a higher position. On the basis of the obtained consents, the Faculty Council decides on announcing a public tender which initiates the procedure of selection for a vacant scientific-teaching, teaching or associate position. The decision also includes the appointment of the members of the Expert Committee. On the basis of this decision, a public tender for the recruitment of the vacant position is announced in the OG, on the website of the European Research Area and on the website of the Faculty of Geotechnical Engineering. In accordance with the Act on Scientific Activity and Higher Education, the competition is open for at least 30 days.
>
> After the closing of the competition, the received applications are submitted to the Expert Committee appointed by the Faculty Council and in charge of the implementation of the further selection procedure and which assesses whether the candidates applied for the competition meet the legal

criteria, the National University, Scientific and Artistic Criteria, and proposes the best candidate to the Faculty Council with a reasoned written opinion, which contains the evaluation of all applicants. Until the adoption of the National University, Scientific and Artistic Criteria, the applicable regulations and decisions prescribing the conditions of selection shall apply.

The Faculty Council decides on the adoption or rejection of the opinion of the expert committee. The decision adopting the opinion of the expert committee is submitted by the Faculty to the competent parent committee, which determines whether the proposed candidate meets the National University, Scientific and Artistic criteria. After the delivery of the decision of the parent committee, all candidates are notified and an employment contract is concluded with the selected candidate (examples of employment of assistants, assistant professors and promotion to full professor).

The Faculty of Geotechnical Engineering, in addition to all legal and institutional regulations that regulate employment for vacancies or higher positions, also applies criteria that serve as an instrument for planning and transparent management of human resources on an annual basis and are an integral part of the Human Resources Management Plan.

Proposals for promotions and new employment are proposed by the Institutes, in cooperation with the Dean, for the period from 1 December of the current year to 30 November of the following year. Each proposal must be accompanied by a written explanation containing specific information on the teaching courses that the proposed employee would take over, with an analysis of the impact on the teaching workload of other teachers. In addition, each candidate is subject to a preliminary assessment at the level of their institutes in accordance with the criteria of the Rectors' Conference, which includes scientific, teaching and professional contributions.

The procedure for the re-election of a teacher shall be initiated five years after the last election or re-election if the teacher has not submitted a request for election to a higher position before the term for which he or she was elected or re-elected. Re-election is carried out according to the procedure prescribed for the election of teachers to a higher position, without announcing a public competition (example of a re-election carried out).

Particular attention is paid to the employment of assistants. In order to include an assistant position in the plan, it is necessary that the candidate is involved in at least one scientific research project registered with the Faculty, with secured funds and with the written consent of the project leader or the director of an external institution. The candidate must have a clearly defined scientific and teaching load. This is in accordance with the prescribed provision of the Collective Agreement for Science and Higher Education (Article 83) that every teacher in an institution must be involved in at least one scientific research project (international, national or institutional).

In this way, the Faculty ensures systematic and responsible management of scientific-teaching, teaching and associate staff, in accordance with the long-term needs of study programs and strategic development goals.

In addition, the Faculty of Geotechnical Engineering of the University of Zagreb systematically promotes excellence in scientific and teaching work through clearly defined procedures for evaluating and rewarding employees, in accordance with the Ordinance on Awards and Recognitions of the Faculty of Geotechnical Engineering. Special emphasis is placed on recognizing the scientific

excellence of employees, which directly supports the strategic goal of the Faculty – strengthening the quality of scientific research and teaching work. Within the category of the Award for Scientific Excellence, the best-scored individuals employed in scientific-teaching and associate positions are awarded annually. The evaluation is based on an objective system of scoring scientific papers, considering authorship, indexing in WoS CC, quarticity of journals and other scientific publications. In addition to the written acknowledgment, it is also possible to receive a cash prize, which is used exclusively for professional development (professional literature, equipment, proofreading, co-financing of registration fees).

In addition, the Faculty evaluates the contribution of employees in the preparation and implementation of scientific projects through special awards for international and domestic research projects. Also, awards are given for long-term contribution to scientific and/or teaching work and for contribution achieved through cooperation with the economy.

With this approach, the Faculty not only recognizes and rewards excellent individuals, but also encourages the development of competencies, scientific productivity and collaborative capacities, which directly contributes to the implementation of the institution's strategic goals in the field of excellence and international visibility.

4.3 The higher education institution provides support to teachers in their professional development

The higher education institution has a teacher development plan with defined performance indicators. On an annual basis, it determines the priorities of teachers' professional development. The criteria for advancing and rewarding excellence are clear, transparent and consistently implemented.
The higher education institution has clearly defined how it provides support to teachers in their professional and career development. Higher education institutions encourage the transfer of knowledge within the organization.
Higher education institutions encourage and provide opportunities to improve teachers' competencies at the institutional level.
Higher education institution provides and encourages the development of teachers' digital skills.
The higher education institution encourages the improvement of teachers' competencies based on collected and analysed feedback on the conducted evaluations of the effectiveness and efficiency of their work (teachers' self-assessment, peer observation, student surveys, focus groups, etc.).
The higher education institution encourages the participation of teachers in international mobility programmes, cooperation networks, etc.
The higher education institution encourages the participation of teachers in international and national competitive projects and provides support in this.

The Faculty of Geotechnical Engineering of the University of Zagreb is aware that the quality of teaching, research and general academic life depends on the continuous professional development of its teachers. Therefore, it systematically encourages and provides support in professional development through various institutional and strategic mechanisms.

As part of the Development Strategy of the Faculty of Geotechnical Engineering 2023-2027. and the Scientific Research Strategy 2023-2027.The goals of strengthening research and teaching competencies, internationalization, participation in projects and raising the overall quality of academic work are clearly set.

The faculty provides support to teachers by:

- encourages and enables participation in education and professional training organized by the University of Zagreb, SRCE, the Agency for Science and Higher Education, CARNet and other accredited institutions, about which teachers are regularly informed,
- supports the participation of teachers in national and international scientific and professional conferences, summer schools and trainings,
- promotes involvement in competitive projects (HRZZ, Horizon Europe, Interreg, etc.) as a way of professional development and knowledge transfer, strengthening recognition at the domestic and international level, in such a way that detailed information on projects is provided at the sessions of the Faculty Council, in addition to the report of the Vice-Dean for Science, a permanent agenda item has been introduced: Project and promotional activities (Minutes 1, Minutes2),
- provides administrative and advisory support in project applications and academic mobility through the Office for International Cooperation and Projects, but also through joint services of the Faculty of Geotechnical Engineering that continuously participate in scientific research and professional activities through their contributions through work on accounting, legal and administrative issues.

- systematically collects and analyses student surveys and other feedback on teachers, based on which the need for additional education is identified.

The Faculty regularly adopts the Promotion Criteria, and all employees through their departments and services are involved in the development of the Human Resources Management Plan that is sent to the University, which represents a transparent promotion plan. The professional development of teachers is also encouraged through the system of rewarding excellence. Namely, every year on the occasion of the Faculty Day, the Faculty awards the best teachers for scientific excellence, scientific projects, and awards are given to employees for special merits, in accordance with the Ordinance on Awards and Recognitions at the Faculty of Geotechnical Engineering and its Amendments. On that occasion, at a ceremonial session of the Faculty Council, the winners are publicly presented with recognition, and the teacher is also awarded a cash prize for some categories.

In the past period, the Faculty has significantly invested in strengthening the digital competencies of teachers, especially in the context of the use of hybrid and online teaching and the use of digital tools in teaching. For this purpose, internal workshops were conducted and resources were provided for the use of digital tools, including the support of the IT Support Service and the availability of modern equipment. As part of the Professional Practice project, three workshops were held to improve the competencies of teaching and non-teaching staff with the following topics:

1. Pedagogical Aspects of Online Teaching and Application of MS Teams and Other MS Tools
2. Experiential learning and teaching with the application of different forms and methods of work
3. Professional leadership skills for teachers - topics such as goal setting, creating activity plans, monitoring progress

The transfer of knowledge within the organization is ensured through joint work on projects, mentoring younger colleagues (assistants) who are in our doctoral study, organization of forums, workshops and popular science events. Special attention is paid to strengthening cooperation between the Institutes, interdisciplinarity and joint approach to external partners.

The scientific research strategy encourages internationalization through inclusion in international research networks, mobilities and scientific conferences, and all realized mobility is entered on the portal of the Records of International Cooperation of the University of Zagreb. In the Records of International Cooperation of the University of Zagreb in the last 5 academic years, the Faculty of Geotechnical Engineering has 152 records of the international stay of the Faculty of Geotechnical Engineering employees abroad (outgoing mobility) and 13 records of the stay of foreign scientists at the Faculty of Geotechnical Engineering (incoming mobility). The Faculty continuously monitors teachers' applications for mobility programs (Erasmus+, CEEPUS, bilateral agreements) and provides institutional support in all phases of implementation through the Office for International Cooperation and Projects.

Teachers of the Faculty are allowed to use the right to a free study year (sabbatical), although there is currently no faculty ordinance on the use of the right to a free study year (sabbatical). The ordinance is being prepared. So far, not a single request for a sabbatical has been received from the teachers of the Faculty of Geotechnical Engineering.

Teachers are also enabled to create an international research network as well as publish research results in internationally relevant journals.

Further improvement of the support system is planned through:

- Keeping accurate records of attended education and competence development,
- strengthening cooperation with professional bodies of the University of Zagreb,
- development of internal guidelines and training calendar,
- and the development of a model of material and non-material stimulation of excellent teachers.

In this way, the Faculty of Geotechnical Engineering creates a stimulating environment for the personal and professional development of its teachers, which directly contributes to the quality of teaching, scientific excellence and general academic progress of the Faculty.

4.4 The space, equipment and the entire infrastructure are suitable for the performance of teaching, scientific and professional activities

The higher education institution plans and improves its infrastructural development in accordance with strategic goals.
A higher education institution has at least 1 m^2 of spatial capacity per student.
The higher education institution has lecture halls, laboratories, i.e. premises for practical classes, a library, an IT classroom, cabinets for teachers and offices intended for the work of professional services.
The lecture halls are equipped with seating for students, a chair and equipment for presenting teaching material. The laboratories are equipped with appropriate laboratory equipment intended for conducting research for the university and for conducting practical classes. Teachers' offices and professional services offices are equipped with office equipment for the work of teachers and professional services.
The higher education institution has a corresponding number of computers available to students and wireless Internet access in all rooms intended for students.
The higher education institution uses appropriate technologies that support all teaching and scientific needs.
The space, equipment and the entire infrastructure (laboratories, IT service, workplaces, libraries, reading rooms, studios, galleries, multimedia halls, cabinets, storage facilities, etc.) are suitable for the implementation of study programmes and ensure the achievement of the envisaged learning outcomes.
The space, equipment and the entire infrastructure (laboratories, IT service, work sites, etc.) are suitable for the realization of scientific/artistic and professional activities.

The Faculty of Geotechnical Engineering is located at Hallerova aleja 7 in Varaždin, where it has a total area of 5144 m². Of this, the space intended for teaching is 2130 m^2, which includes seven lecture rooms with an area of 837.00 m^2 and teaching laboratories/practicums occupying 575.00 m^2, two work areas and other premises intended for teaching (list by room). The Faculty has a total of 36 teachers' offices, with an average area of 16 m². All cabinets are connected to the Internet network and are technically adapted to carry out teaching and research activities, with part of the space also equipped with air conditioners.

Six classic lecture rooms, two computer classrooms and the Aula Magna are available for classes. All spaces intended for the teaching process meet the prescribed material and technical conditions and meet the minimum standards applied to the teaching space of technical colleges. The total area of the premises in which classes take place (including the aforementioned lecture halls, Magna Auditorium, laboratories and practicums) is 2130 m², with a total capacity of 618 seats for students. In the last academic year, 135 students studied at the Faculty of Geotechnical Engineering, which represents a spatial capacity of 17.32 m^2 per student.

All lecture halls are equipped with a computer in the department and a projector. The two computer classrooms have a total of 35 computers, on which, in addition to the basic software, specialized programs such as AutoCAD, Plateia, Urbano, ArcGIS, QGIS, FeFlow and GeoSlope are installed, which allows students to work practically in teaching, i.e. holding exercises in computer practicums as well as individual work of students in the preparation of diploma and final theses. All three functional units of the building – cabinets, lecture rooms and Aula Magna – are interconnected by a high-speed optical network, while the internal network distribution is carried out via a category 6 wired installation.

For the purposes of teaching and research, as well as professional projects that include cooperation with the economy, three modernly equipped laboratories are available: the Geotechnical Laboratory, the Laboratory for Environmental Geochemistry and the Laboratory for Environmental Engineering.

In addition to them, functionally equipped Chemical and Geotechnical Practicum were established within the faculty, which are an integral part of the teaching process.

Within the Faculty of Geotechnical Engineering, thanks to investments through two ESF projects, three completely new spaces have been formed: the STEM Centre for Children and Youth, the Makerspace Classroom and the Multifunctional Lecture Hall.

The STEM Centre for Children and Youth has almost 170 m2 of usable space in which activities for the popularization of STEM among children and young people are carried out, with a special emphasis on its natural science part. Since the STEM Centre also houses the permanent exhibition of the Geological Collection, with more than 160 samples of rocks and minerals, and all the accompanying materials for the exhibited samples, the space has an added value that is increasingly recognized for teaching geography in nearby high schools. The STEM centre is fully equipped with functional furniture so that the space can be easily turned into a classroom, lecture hall or empty museum space, and offers primary and secondary school students a large number of interactive STEM workshops related to the topic of environmental engineering.

The Makerspace classroom, which is also located within the STEM centre but forms a separate unit, has the basic purpose of providing students and teachers with a place to create and test ideas, develop new skills and creativity in a slightly different, relaxed environment, but also to make the space a place for cooperation between different disciplines and areas of interest. Within the Makerspace space, programs and workshops are offered for students and high school students and all interested people from the local community. The goal is to increase awareness of different technologies and skills and to popularize the STEM field. In the Makerspace, students will also be able to organize their own workshops and lectures, in order to share their knowledge and experience with their peers and anyone interested.

The multifunctional lecture hall is a refurbished space of the old office in the very hall of the faculty. It is equipped in such a way that it enables the application of innovative learning methods (Innovative Learning Methods) that will help students to better master the material during their studies. The advantage, compared to a classic lecture hall, is that it can be easily adapted to different needs, from traditional teaching to interactive workshops, presentations, teamwork and other activities, it can be used for smaller video conferences, webinars, debating, etc. It allows flexibility in the organization and implementation of different activities, and students and employees can work in groups or individually, depending on the needs of the project or specific activity. The lecture hall is equipped with flexible furniture, but also with modern technology – a large-sized interactive touch screen, a projector and projection screen, a wireless presentation system, audio and video equipment, tablets and other devices that enable better interaction between lecturers and students. It is located in the immediate vicinity of the entrance to the faculty, in the central part of the hall, which ensures exceptional spatial accessibility and easy orientation. Such a location is particularly conducive to the organisation of public events open to the community, while at the same time allowing easy access for all users, including persons with reduced mobility or other forms of physical limitations. This further underlines the role of the Faculty as an inclusive and open academic space, sensitive to the different needs of individuals and society.

The quality and functionality of the space and the availability of IT infrastructure are regularly evaluated through the student Survey for the evaluation of studies as a whole, at the undergraduate level. The table shows the average grades of undergraduate students over a period of five academic years, covering key aspects such as the arrangement of the space, the equipment of teaching halls and laboratories, and the accessibility of computer equipment and the Internet. The results show a continuously high level of student satisfaction, with a particularly pronounced positive trend in the field of spatial adequacy in relation to the number of students and the equipment of the space for performing exercises.

Table 6: Results of student surveys for the evaluation of space and IT infrastructure

Question	2018/2019	2019/2020	2020/2021	2021/2022	2023/2024
Number of respondents	50	44	27	21	36
General quality and tidiness of premises (buildings, access to the faculty etc.)	4.1	4.39	4.59	4.57	4.31
Equipment of lecture halls	4.04	4.27	4.44	4.38	4.17
Equipment of the premises in which exercises are performed (laboratories, seminars, etc.)	4.12	4.51	4.67	4.62	4.42
Adequacy of space considering the number of students	4.22	4.55	4.74	4.81	4.89
Possibility of access to computers and Internet within the faculty premises	4.31	4.42	4.81	4.43	4.56
Total	**4.15**	**4.43**	**4.64**	**4.56**	**4.47**

4.5 The library and its equipment and access to additional facilities ensure the availability of literature and library services for the needs of quality studies and quality scientific and educational activities

The library and its equipment and access to additional content ensure the availability of literature and library services for the purposes of conducting study programmes, as well as scientific/artistic and professional work (availability of teaching literature and literature for scientific/artistic and professional work, availability of information and communication technology means, access to library materials in printed and/or electronic form).
The library and its equipment and additional facilities ensure the requirements for quality study in accordance with, among other things, the conditions prescribed by the Standard for Higher Education, University and Research Libraries (OG 81/22).
The higher education institution provided teaching literature and literature intended for scientific and professional work.
Students and teachers have access to information and communication technology.
Students and teachers are provided with access to library materials in printed and/or electronic form.
The library and its equipment and additional facilities ensure the requirements of quality study.
The library and its equipment and additional facilities ensure the requirements of quality scientific-teaching/artistic-educational activities.

According to the Statute of the Faculty of Geotechnical Engineering, the Faculty Library is part of the university library system. The organization and scope of work of the library, the work of library employees and the management of the library are regulated by the Library Work Regulations. The Head of the Library is responsible for his work to the Vice-Dean for Education and the Dean, and the supervision of the development and operation of the library system is carried out by the Library Committee, which is appointed by the Faculty Council on the proposal of the Dean.

The Library of the Faculty of Geotechnical Engineering was officially established on January 26, 1990. It is located in the Faculty building next to the lecture halls, which makes it easily accessible to students. The orientation of the windows towards the east side gives a great advantage to the space because it provides good ventilation, which is especially important for the protection of books and their storage, as well as an excellent source of daylight for reading, studying and a longer stay in the library space. The available space is arranged according to the recommendations of the Standards for Higher Education Libraries, and is divided into two parts, the reading room and the book space (total area: 118 m2). Both rooms have built-in air conditioners for additional ventilation and maintaining controlled temperature and humidity levels. In the first part, there is a reading room for quiet work, a computer workshop and a magazine reading room. There is no separate entrance area, but the entrance is far enough away so as not to disturb the work of the reading room excessively. In the second part, there is the librarian's office and all the library's materials: basic and supplementary literature, collections of graduate and final theses, reference collection and collection of journals. In this space, all library tasks are performed, such as the acquisition of materials, receipt of materials and their professional processing.

During the library's working hours, all library resources are freely available to users. Basic information related to the work of the library is also available on the website. In this way, you can get all the necessary information about the services offered by the library: membership, loan, online catalogue, use of the reading room, inter-library loan, bibliometric services (available only to employees of the Faculty of Geotechnical Engineering) and publishing.

The Library's publicly accessible online catalogue is accessible from anywhere and at any time and provides information on the library's holdings and the availability of copies. It allows for simple and complex searches with the desired criteria. On the library catalogue, you can access your user account, scientific databases, and the Merlin system.

All students are also free to use the reading room, which includes a computer workshop, and the space is intended for quiet work, and if necessary, for teamwork. Users have at their disposal library materials and computers with free Internet access and the ability to search for online resources. If necessary and interested, the library organizes workshops for the use of online resources for both employees and students.

From bibliometric services, the Library prepares a certificate of representation and citation of scientists' papers in relevant databases and a certificate of representation of journals for the needs of the editorial board of the scientific journal of the Faculty, and in order to obtain the certificate, it is necessary to send a request to the Library by e-mail.

The library fund is systematically increasing, and the acquisition mainly follows the needs of the curriculum. Domestic and foreign literature is purchased, mainly textbooks, collections, dictionaries and manuals, with the financial resources sufficient to cover only the needs of the acquisition of basic literature. Supplementary literature is provided by inter-library loan. In addition to the acquisition and maintenance of the library fund, the Faculty of Geotechnical Engineering also supports the publishing activities of the Faculty of Geotechnical Engineering within the Library of the Faculty of Geotechnical Engineering.

In the Library of the Faculty of Geotechnical Engineering (reading room) there is a permanent exhibition "Surveying", which was presented by prof. Božidar Kanajet, PhD, donated to the Library of the Faculty of Geotechnical Engineering. The collection is housed in six showcases in the Library's reading room, and contains about a hundred-year-old drawing supplies, various measuring instruments, cameras, logarithmic and mechanical computers, geodetic plans, plans, maps, professional books, old laws and regulations.

4.6 A higher education institution provides the necessary financial resources for the performance of teaching, scientific and professional activities

A higher education institution has a financial plan that contains planned revenues and expenditures for the performance of higher education and professional activities for a three-year period (the financial plan of a university, faculty or art academy or polytechnic should also contain planned revenues and expenditures for the performance of scientific, artistic and professional activities).
A public higher education institution proves that it has the funds necessary for the implementation of studies by concluding a programme agreement, a projection of tuition revenues or other revenues.
Financial sustainability and efficiency are visible in all aspects of the work of a higher education institution.
A higher education institution manages financial resources transparently, efficiently and purposefully.
Additional sources of funding are used for the development and improvement of higher education institutions.
Additional sources of financing are provided through domestic and international projects, cooperation with industry, local community, etc.

FINANCIAL MANAGEMENT OF THE FACULTY

The Faculty of Geotechnical Engineering finances the performance of its activities and responsibly and transparently uses the founder's financial resources (funds from the State Budget of the Republic of Croatia that are transferred on the basis of program agreements), earmarked financial resources and its own financial resources.

More business-related information is also available on two separate official websites: Financial Operations and Public Procurement. Numerous financial documents are publicly available on this website, such as: a list of economic entities with which the Faculty of Geotechnics is in a conflict of interest; the current Ordinance on Simple Procurement, as well as all previous ones; the current Public Procurement Plan, as well as all previous ones; public procurement procedures and registers of contracts by year; the current Financial Plan, as well as all previous ones; Financial reports by year; monthly reports on the spending of funds.

The Faculty of Geotechnical Engineering uses earmarked financial resources for the purpose of: improving higher education and scientific activities and achieving strategic, special and own institutional goals arising from the law (e.g. modernization of study programs; development of student support services and improvement of student standards; internationalization of the results of scientific and artistic programs and projects; development of programs and projects that strengthen social engagement in the community, with a focus on strengthening diversity, equity and social inclusion in higher education and science; fostering international mobility and international and inter-institutional cooperation, with particular support for inclusion in university networks as part of the European Universities initiative; construction of new and consolidation of existing teaching, scientific and artistic infrastructure; development of programmes and projects of particular importance for the economy and social development; implementation of programs and projects of interest to the Republic of Croatia; organisational and functional integration of public higher education institutions; intellectual property management; commercialization of research results, scientific programs and projects).

During the year, the Vice-Dean for Management regularly presents at the sessions of the Faculty Council: quarterly, semi-annual, nine-month and annual financial report, whereby the Faculty Council votes on the acceptance of the annual financial report.

In accordance with the Instruction of the Ministry of Finance on the Framework Content, Minimum Data Set and Method of Public Disclosure of Information on the Spending of Funds (OG 59/2023), the Faculty of Geotechnical Engineering, as the budget user of the State Budget of the Republic of Croatia, regularly publishes data on the disbursement of budget funds on its official website once a month, while payments made through the single budget account are published by the Ministry of Finance (Art. 6 of the Instruction). Information on the spending of funds is easily accessible, searchable and machine-readable, and in accordance with the Instruction, it is published by the 20th of the month for the previous month. Published information on the spending of funds based on the Instruction must be available for a period of at least 10 years from the date of publication.

Activities related to the business segment are regularly presented at the sessions of the Faculty Council, through information and reports of the Vice-Dean for Management, and at each session of the Dean's Board, in a broader composition, the Vice-Dean for Operations reports on the current state of financial resources by individual departments and basic funds and the consolidated financial condition for project activities and professional projects on the last day of the current month.

During 2023, a comprehensive analysis of business operations for the period since 2002 was also made, which was presented by the Vice-Dean for Management at the session of the Faculty Council in 2022/2023 held on 17 May 2023. The analysis included: the state of finances in the period from 2002 to 2022, the development of own revenues in the period from 2005 to 2022 and the trends in the costs of external cooperation in teaching from 2022 to 2023.

- **FINANCIAL PLANS**

The Faculty of Geotechnical Engineering independently (autonomously) disposes of its property and its own financial resources, in accordance with its financial plans, acts of the Republic of Croatia, the Statute of the University of Zagreb (2023) and the Statute of the Faculty of Geotechnical Engineering (2023).

During October, a proposal of the Financial Plan for the next three years is drafted, which, after the consent of the University of Zagreb and the Ministry of Science and Education, is accepted at the session of the Faculty of Agriculture in November or December. During December or January, the annual Public Procurement Plan is adopted.

The financial plan of the Faculty of Geotechnical Engineering shall be adopted for each calendar year, cumulatively in accordance with the law governing the budget system, bylaws adopted on the basis thereof, the Statute of the University of Zagreb, the Statute of the Faculty of Geotechnical Engineering, the Programme Agreement of the University of Zagreb, the Programme Agreement of the Faculty of Geotechnical Engineering and the Unified Programme Agreement of the University of Zagreb, which combines the Programme Agreement of the University of Zagreb and the Programme Agreement of the University of Zagreb contracts of all components.

The financial plan shall contain the financial plan for the next financial year and the projections of the financial plan for the next two financial years. The financial plan of the Faculty of Geotechnical Engineering shall be adopted by the Faculty Council at the Dean's proposal.

From 2023, according to the Ordinance on the Semi-Annual and Annual Report on the Execution of the Budget and the Financial Plan (OG 85/2023), budget users, including the constituents of the University of Zagreb, are obliged to submit to the Faculty Councils for adoption a proposal of the semi-annual and annual report on the execution of the financial plan for the past period, and upon adoption, submit the entire documentation to the Ministry of Science, Education and Youth, and the University of Zagreb, which accepts the consolidated report on execution by the Senate.

- **PROGRAM AGREEMENTS**

The Programme Agreement of the Faculty of Geotechnical Engineering will determine the multi-year financing of the State Budget of the Republic of Croatia, in accordance with the Regulation on Programme Financing of Public Higher Education Institutions in the Republic of Croatia – but only after the Programme Agreements are signed, because they have not been signed so far and until now the financing has been tied exclusively to annual decisions on the financing of public higher education institutions – it is currently valid for 2024/2025.

Program contracts will consist of basic budget component, development budget component, implementation budget component. The program agreement for the Faculty of Geotechnical Engineering is negotiated by the Rector and the Dean, and is signed by the Dean after it is adopted by the Faculty Council of the Faculty of Geotechnical Engineering and the Senate of the University of Zagreb. The components of the programme agreement of the Faculty of Geotechnical Engineering shall be determined in the process of its negotiation. The program agreement of the Faculty of Geotechnical Engineering contracts the achievement of goals that are harmonized with national strategic planning acts. The elaboration of the basic budget component, the development budget component and the executive budget component are defined by the Statute of the University of Zagreb (2023) and the Higher Education and Science Act (2022). This process is ongoing and will not be completed until the writing of this Self-Analysis is completed.

- **PUBLIC PROCUREMENT**

The Ordinance on Simple Procurement of Goods, Services and Works (2023) regulates simple procurement procedures up to the value to which, in accordance with Article 12, paragraph 1, point 1 of the Procurement Act. of the Public Procurement Act (2016) do not apply the provisions of the Act (procedures for the procurement of goods and services with an estimated value of up to € 26,540.00 and for the procurement of works with an estimated value of up to € 66,360.00).

In the implementation of simple procurement procedures, other applicable laws and bylaws, as well as internal acts relating to a particular subject of procurement in terms of special laws and general and special acts of the Faculty of Geotechnical Engineering, must be applied. In the implementation of procedures, the use of electronic means of communication, the use of non-electronic means of communication or a combination thereof shall be provided. Public procurement procedures at the Faculty of Geotechnical Engineering are coordinated and controlled by the Office for International Cooperation and Projects.

The Ordinance prescribes, among other things: exceptions in procedures; procurement principles; conflict of interest; initiating and preparing procurement procedures; simple procurement procedures with an estimated value of less than € 9,290.00 as well as those procedures greater than this amount; the content of the invitation to tender; the method, deadlines for delivery, conditions of competence and conditions for qualitative selection; the appearance and content of the cost estimate; Warranty; the procedures for submitting, receiving, opening and evaluating tenders; verification of the computational correctness of the bid.

- **RASPODJELA NAMJENSKIH I VLASTITIH PRIHODA**

At the Faculty of Geotechnical Engineering, the manner and procedure of realization and distribution of funds generated on the basis of activities from the Faculty of Geotechnical Engineering's own supplementary activity and funds generated from the income from the lease, sale and use of the premises and equipment of the Faculty of Geotechnical Engineering, is regulated by the Ordinance on the Realization and Manner of Use of Own Funds (2021). Performing tasks from its own supplementary activity is an integral part of the activities of the Faculty of Geotechnical Engineering, which contributes to the reputation and further development and serves to improve scientific work, theoretical and practical teaching and field exercises. The holder of its own supplementary activity is the Faculty of Geotechnical Engineering.

Given that on 11 July 2024, two new ordinances of the Ministry of Science, Education and Youth were adopted: the Ordinance on the criteria and manner of using earmarked donations and own revenues of budget users under the jurisdiction of the Ministry of Science, Education and Youth (OG 79/2024) and the Ordinance on the criteria and manner of using earmarked revenues of budget users under the jurisdiction of the Ministry of Science, Education and Youth (OG 79/2024), it was necessary to adopt a new general act regulating the realization and use of non-earmarked donations and own revenues, i.e. earmarked revenues, which must be drafted in accordance with the aforementioned Ordinances and with the prior consent of the Ministry of Science, Education and Youth.

On the basis of the aforementioned regulations and the Act on Higher Education and Scientific Activity (OG 119/2022) and the provision of Article 2, paragraph 1, point 2 of the Statute of the University of Zagreb, the Faculty of Geotechnical Engineering has developed a new Ordinance on the realization and manner of using earmarked revenues, own revenues and non-earmarked donations of the Faculty of Geotechnical Engineering (2024). The Ordinance defines, among other things, the following:

- use of earmarked revenues (earmarked revenues for the improvement and development of higher education and scientific activities; earmarked donations, assistance and funds and foundations; use of revenues from earmarked projects)
- use of own revenues (expenditures related to own revenues; making offers and concluding contracts; distribution of own income; intellectual, field and laboratory work; education, seminars, courses, conferences, lifelong learning and other training programs; performing publishing and exhibition activities and selling books; leasing or renting land, premises and equipment)
- Use and distribution of unintended donations
- remuneration, salary increase, salary supplements
- Usage Reporting

After its development, the Ordinance was adopted at the session of the Faculty Council in 2024/2025 held on 29 January 2025 and the Faculty submitted it to the Ministry of Science, Education and Youth for prior approval. By 1 July 2025, we have not received any comments on the adopted Ordinance.

- **RESPONSIBLE AND EFFICIENT ENERGY AND WASTE MANAGEMENT**

For the purpose of optimization and more rational consumption of energy products during the winter semester, from the academic year 2022/2023, the Faculty of Geotechnical Engineering acts in accordance with the Guidelines for Energy Management at the Faculty of Geotechnical Engineering (academic year 2022/2023, 2023/2024.) adopted by the Dean at the beginning of the winter semester, which include, among other things, a decision on an adjusted schedule of working hours during the winter semester. The guidelines were adopted for the first time in accordance with the Energy Efficiency Act (OG 127/14, 116/18, 25/20, 32/21, 41/21), the Ordinance on Systematic Energy Management in the Public Sector (OG 18/2015) and the Guidelines of the Government of the Republic of Croatia for Energy Savings in the Republic of Croatia (28 July 2022).

During 2019, the Waste Management Plan at the Faculty of Geotechnical Engineering was developed with the purpose of providing an overview of the current situation at the Faculty of Geotechnical Engineering in terms of waste management, in such a way that the activities from which waste is generated were determined, the categories of waste that are generated, the characteristics of waste, waste streams, the amount of waste, the method of collection and treatment of waste, and to propose measures for sustainable waste management based on the data obtained. It is important to point out that the Plan was independently developed by students of the Faculty of Geotechnical Engineering, with the mentorship of professors and assistants. In order for the management plan to function and come to life, during 2020, trainings for employees and students on separate waste collection were organized at the Faculty of Geotechnical Engineering.

- **REPORTING ON POSSIBLE IRREGULARITIES IN THE MANAGEMENT OF FUNDS**

Pursuant to the Act on the Protection of Whistleblowers (OG 46/2022) and the Ordinance on the Conduct and Reporting of Irregularities in the Management of Funds of Public Sector Institutions (OG 78/2020) and in accordance with the Fiscal Responsibility Act (OG 111/18, OG 83/2023) and the Regulation on the Preparation and Submission of the Statement on Fiscal Responsibility and the Report on the Application of Fiscal Rules (OG 95/2019) and in accordance with Pursuant to the Ordinance on the Procedure for Internal Reporting of Irregularities and the Appointment of a Confidential Person at the Faculty of Geotechnical Engineering (2023), the Annual Report on Possible Irregularities in the Management of Funds is submitted every year, within the deadlines and in the manner as and when requested by the competent ministry.

The receipt of reports, procedures and reporting on irregularities in the management of the funds of the Faculty of Geotechnical Engineering is carried out in accordance with the Ordinance (OG 78/2020) and in accordance with the Regulation (OG 95/2019).

A confidential person at the Faculty of Geotechnical Engineering has been appointed in accordance with Articles 16 and 17 of the Law on Geotechnical Engineering. Ordinance on the Procedure for Internal Reporting of Irregularities and the Appointment of a Confidential Person at the Faculty of Geotechnical Engineering (2023), and accordingly prepares and prepares and prepares the Annual

Report on Irregularities for the previous year, pursuant to Article 3, paragraph 6 of the Rules of Procedure. of the Ordinance (OG 78/2020). He shall also be appointed as a coordinator for filling in the Questionnaire, drafting the Plan for the Elimination of Weaknesses and Irregularities and the Report on Eliminated Weaknesses and Irregularities Determined in the Previous Year at the level of the Faculty of Geotechnical Engineering, in accordance with Article 5 of the Law on the Elimination of Weaknesses and Irregularities. Regulation (OG 95/2019).

In accordance with Article 15, paragraph 4 of the of the Ordinance (OG 78/2020) and Article 5. of the Decree (OG 95/2019), the services of the Dean's Office of the Faculty of Geotechnical Engineering are available to assist the confidential person in the preparation and compilation of the annual report and the Questionnaire.

- **STATEMENT ON FISCAL RESPONSIBILITY**

From 1 January 2019, the new Fiscal Responsibility Act (OG 111/2018) is in force. The law prescribes the obligation to provide a Statement of Fiscal Responsibility, as an annual statement for the head of the budget user of the state budget, which includes faculties, including the Faculty of Geotechnical Engineering. The statement is submitted to the Ministry of Finance through authorized access to the application: Strengthening Fiscal Responsibility and Internal Control System.

In accordance with the obligation, the Dean of the Faculty of Geotechnical Engineering also confirms every year: legal, purposeful and purposeful use of funds; efficient and effective functioning of the internal control system within the framework of the budgeted or financial plan.

The Decree on the Preparation and Submission of the Statement on Fiscal Responsibility and the Report on the Application of Fiscal Rules (OG 95/2019) prescribes the appearance and content of the Statement and supporting documentation, the procedure and deadlines for drafting and submitting the Statement, as well as the manner and deadlines for reporting to the Ministry of Finance on the observed irregularities after the verification of the content of the statements. The Regulation also prescribes the manner of keeping the Register of Companies and Other Legal Entities Obliged to Issue the Statement.

Every year, on the basis of the Fiscal Responsibility Questionnaire, the Dean issues a Statement, based on the orders and recommendations of the State Audit Office (if applicable), i.e. external audit (if applicable) and available information on the work of the Faculty of Geotechnical Engineering, which is usually prepared by the Accounting Department.

V. SCIENTIFIC AND PROFESSIONAL ACTIVITY

5.1 A higher education institution is recognizable for its scientific research and/or artistic achievements in all scientific fields in which it conducts studies

The higher education institution bases its scientific work on original ideas and an original scientific approach.
The number and quality of published papers of higher education institution teachers is at the highest level.
The results of teachers' research significantly contribute to the development of the scientific field in which they operate.
A higher education institution has a satisfactory number of scientific papers in prestigious primary modes scientific communication in their area/field.
The University has a satisfactory number of papers presented at prestigious conferences.
The university is involved in a satisfactory number of competitive projects.
A higher education institution is an organizer of scientific conferences that are nationally and internationally recognizable.
Higher education institution teachers participate in the work of committees and other higher education and science bodies.
External associates are recognized experts in their field, have appropriate scientific or professional backgrounds. works and relevant work experience.
Teachers of higher education institutions participate in the work of the editorial boards of scientific journals.
A higher education institution has an organized publishing activity and is a publisher of scientific publications that are nationally and internationally recognized and recognizable.

The Faculty of Geotechnical Engineering, a constituent part of the University of Zagreb, is the only institution in the Republic of Croatia that conducts scientific research in the field of technical sciences: the field of interdisciplinary technical sciences (environmental engineering), the fields of civil engineering (branches of geotechnics and hydraulic engineering) and mining, petroleum and geological engineering, chemical engineering, geodesy and in the field of natural sciences (mathematics, chemistry, physics, biology, geophysics). The Faculty of Geotechnical Engineering, as a constituent part of the University of Zagreb, is a Faculty with a clear research profile, which wants to confirm itself at the national level as one of the leading research institutions in the field of environmental engineering, especially those of its segments that are focused on the identification, design, construction and management of systems for solving the problems of protection and pollution of air, water and soil, nature, circular economy, on the system of addressing and adapting to sectoral pressures on the environment and climate, including decarbonisation, the impact on the population and the local community, and responding to cross-sectoral challenges. The Faculty of Geotechnical Engineering is well on its way to becoming a nationally and internationally recognizable institution in its research activity, which is involved in international research cooperation and research mobility programs, whose capacities respond to the challenges of the green transition. This policy is in line with the Development Strategy of the Faculty of Geotechnical Engineering of the University of Zagreb for the period from 2023 to 2027., the Scientific Research Strategy of the Faculty of Geotechnical Engineering for the period 2023 to 2027. and the Statute of the Faculty of Geotechnical Engineering.

On the basis of the undergraduate, graduate and especially doctoral study program Environmental Engineering, overall, **the scientific field of activity of the Faculty is in the field of technical sciences,**

the field of Interdisciplinary Technical Sciences, the branch of Environmental Engineering. However, due to the different structure of the scientific and teaching staff, the scientific field of activity is in the field of natural sciences (Chemistry, Physics, Mathematics, Biology, Geophysics) and the field of technical sciences (Geodesy, Civil Engineering, Mining, Petroleum and Geological Engineering, Chemical Engineering, Basic Technical Sciences, Interdisciplinary Technical Sciences)

The Research Profile of the Faculty of Geotechnical Engineering (GFV-ID) was created based on the mission and vision of the faculty, as well as the desire to affirm itself as an institution that offers relevant education in the STEM field.

The research profile is made exclusively in English, precisely because of the need to increase recognition in the international community, and includes areas in which there is extensive scientific and professional experience, as well as a clearly realized transfer of knowledge.

The strengthening of scientific research activities is based on the implementation of modern strategies and concepts that enable sustainable development and innovation in environmental engineering.

We help scientists at the beginning of their careers and all those interested in how to write a scientific paper, with workshops such as the workshop entitled: "How to write and successfully publish a scientific paper in a top journal and how to avoid frequent mistakes when preparing a scientific paper?"

By the decision of the Faculty Council, the international ISAB-GFV Advisory Board was established (19 October 2022). The Committee consists of 5 eminent experts from universities from Italy, Slovenia, Sweden, the United Arab Emirates and the United Kingdom of Great Britain). ISAB-GFV is focused on improving the international scientific recognition and internationalization of the Faculty's scientific activities.

The Student Union, together with the Management Board and employees, works intensively to engage students in work on projects, scientific research and popularization of science. Students are co-authors of scientific papers and present the results of their research at international and domestic conferences.

Although the period of the COVID-19 pandemic was challenging and limited the movement of researchers and work in institutions, the number of published scientific publications was at higher levels than in previous years. According to the available data from CRORIS at the time of writing this Self-Analysis, in the last five years (2020-2024), a total of 212 scientific papers has been published in international and domestic journals. Of these, 134 are scientific papers that have been published in journals that are indexed in the following Web of Science Core Collection (WoSCC) citation indexes: Science Citation Index – Expanded (SCI-EXP), Social Science Citation Index (SSCI) or Arts and Humanities Citation Index (A&HCI). Of these, 69 papers came from international cooperation and 148 papers from cooperation with other institutions in the Republic of Croatia. In the observed period, 48 scientific papers were published in journals indexed in the WoSCC citation index Emerging Sources Citation Index (ESCI), of which 31 papers resulted from cooperation with other institutions in the Republic of Croatia and 14 papers derived from international cooperation. There were also 8 papers indexed in the Scopus database (not including those indexed in WoSCC), and another 22 scientific

papers in other journals. A total of 8 book chapters has been published, 2 author's books published in Croatia, 1 editorial book published in Croatia.

Teachers and associates of the Faculty of Geotechnical Engineering were very active in presenting the results of their scientific research work at international domestic conferences. 74 scientific papers and 27 professional papers have been published in the proceedings.

Publications and results of scientific research are regularly published on our website and through publication on official social networks.

Through great interdisciplinarity in the conducted research, the results of the teachers' research significantly contribute to the development of the scientific field of environmental engineering, but also in other areas related to the topic of the environment. This is evident from the spectrum of the field in which the papers were cited: the most citations (without self-citations) in the observed period were in the field of environmental sciences (22%), followed by ecology (15%), plant science (11%), multidisciplinary geosciences (9%), water resources (8%), chemical engineering (8%), multidisciplinary materials sciences (7%), physical chemistry (7%), environmental engineering (7%) and chemistry multidisciplinary (6%).

The analysis of published scientific and professional papers shows a large number of papers resulting from cooperation with higher education institutions and scientific organizations in the country and abroad (Faculty of Chemical Engineering and Technology, Faculty of Civil Engineering of the University of Zagreb, Ruđer Bošković Institute in Zagreb, Department of Chemistry of the University of Osijek, Croatian Geological Institute, Faculty of Biotechnology and Drug Development and Faculty of Civil Engineering and Engineering of the University of Rijeka, University North, Federico II University of Naples, Jožef Stefan Institute Slovenia, Institute of Earthquake Engineering & Engineering Seismology North Macedonia, University of Catania Italy, Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México Mexico, Masaryk University Czech Republic, PBL Netherlands Environmental Assessment Agency, Netherlands, etc.) and with associates and scientists from the economy (Hrvatske vode, Gumiimpex - GRP d.o.o., Croatian Institute of Public Health, Međimurske vode d.o.o., Varkom d.o.o., Koprivničke vode d.o.o., Saponia d.d., Premifab d.o.o., SPP d.o.o., Plinacro d.o.o., etc.).

The quality of published papers is also shown by the high citation of papers according to the WoSCC and Scopus databases. In the observed period, according to the data of the Web of Science Core Collection (WoSCC), the total citation rate of papers published in journals indexed in that database, without self-citation, is 1359, the total h-index: 18, which is an increase compared to the previous period from 2015 to 2019, when the citation rate of papers was 1271. Teachers of the Faculty of Geotechnical Engineering have published a large number of scientific papers in prestigious scientific journals, of which most of the papers (69%) published in the Web of Science database are categorized in the first and second quartiles (Q1 and Q2). Table 5.2 with highlighted publications for the observed period can be found in the Analytical Annex.

Through intensive scientific and research work, the Faculty of Geotechnical Engineering continuously works on improving its research capacities and strives to position itself on the European and world map of scientific excellence, which includes strengthening and developing cooperation with small and medium-sized enterprises through a large number of professional projects. There is also cooperation with the private sector through cooperation in scientific research, the development of doctorates,

technology transfer and innovations, which will be discussed below. Furthermore, in the observed period, the Faculty of Geotechnical Engineering was awarded the First Cycle of six institutional projects (2019-2022), which ended in the academic year 2021/2022, and in September 2022, the Final Report at the Faculty of Geotechnical Engineering was presented. The programme financing envisaged for the next period will enable the financing of four-year institutional projects.

In the observed period, several competitive and capital projects were implemented at the Faculty of Geotechnical Engineering (IRI Competitiveness and Cohesion, Croatian Science Foundation), while a large number of scientific research projects were included in the research projects (HRZZ, Interreg, UKV, etc.). Also, teachers were actively involved in a large number of international networking projects from the HORIZON group – COST projects (European Cooperation in Science and Technology). The list of projects is available at the link.

Records of projects are duly kept, and they are entered into the databases of projects and supports. (List of UMSP projects). In the period from 2020 to 2024, the Faculty of Geotechnical Engineering participated as a holder or partner in a total of 33 different projects, including 28 scientific research projects (of which 12 are institutional), 1 infrastructural, 1 professional, 1 bilateral and 2 curriculum development. Of these projects, the Faculty of Geotechnical Engineering was the holder of 19 scientific research projects (of which 12 were institutional) and 1 curriculum development, while it participated as a partner in the others. Most of the projects were financed from European funds as part of the regional development funds, then from the tenders of the Croatian Science Foundation and the Ministry of Science and Education of the Republic of Croatia. The reference list of projects contained in the CroRIS system, i.e. in the Analytical Annex in Table 5.6, contains a slightly smaller number of projects (28) compared to the actual situation due to the fact that institutions such as the Croatian Science Foundation do not allow the entry of the partner institution (and consequently all associates from the partner institution) into the CroRIS system, but only the institution that is the project leader.

The Faculty of Geotechnical Engineering actively encourages the application and participation in projects and the procurement of research equipment, with the aim of achieving the results necessary for quality scientific publications and advancements. Employees are regularly informed about open tenders and programs for applying for domestic and international projects. Scientific research work at the Faculty of Geotechnical Engineering is carried out through international and domestic projects and short-term financial support for research. In addition, the Faculty collaborates with industry and other academic institutions, allowing researchers to access the latest trends and technologies.

The focus on the project method of financing research and development and cooperation with the economy in the observed period was mostly covered by three capital projects. Through partnership on the VIRTULAB Infrastructure Project; VIRTULAB is a virtually networked scientific research laboratory for primary and secondary raw materials. It was created by equipping and integrating fifteen laboratories at five constituent parts of the University of Zagreb, through which capital equipment was purchased in the Laboratory for Environmental Engineering at the Faculty of Geotechnical Engineering. The other two large projects in cooperation with the economy co-financed through the Operational Program "Competitiveness and Cohesion" 2014-2020. are the project Waste and Sun in the Service of Photocatalytic Decomposition of Micropollutants in Water and the project Recycled Rubber and Solar Photocatalysis – Ecological Innovation for Passive Air and Health

Protection, through which capital equipment was purchased, space was arranged and several young researchers were employed. This created conditions for strengthening cooperation with the public sector in research, development of innovations, all with the aim of improving the overall competitiveness of the Croatian economy. Throughout the observed period, intellectual property was protected through 1 patent application and 2 utility models. Also, 3 gold medals and 1 Grand Prix award for innovation were received at the ARCA and AgroARCA innovation fairs. The Faculty of Geotechnical Engineering has had its representatives in the Croatian Association of Innovators since 15 December 2021.

Furthermore, through the Internship in the Economy projects from the National Recovery and Resilience Plan 2021-2026 fund, our teachers were mentors to doctoral students in the economy.

The Faculty of Geotechnical Engineering has been a co-organizer of several international conferences, the most important of which are:

- International Symposium on Waste Management, Zagreb (2022, 2024)
- 17th International Conference "Challenges in Environmental Science and Engineering CESE - 2024" (October 13-17, 2024.)
- The 7th International conference on New Photocatalytic Materials for Sustainability Environment and Energy (NPM-7) / The 8th International conference on Photocatalytic and Advanced Oxidation Technologies for Treatment of Water, Air, Soil, and Surfaces (PAOT-8), Varaždin
- 17th Crisis Management Days, May 2024, Tuhelj
- 10th International Conference WATER FOR ALL, April 2024, Plitvice Lakes
- International Conferences European GREEN Conference, Vodice

Since 2021, the Faculty of Geotechnical Engineering has been organizing a doctoral conference entitled "Research in Environmental Engineering", inviting all doctoral students in the technical field, as well as interdisciplinary ones, their mentors and all interested parties to prepare and present their papers related to the topic of environmental engineering. Issues in the field of environmental engineering require an interdisciplinary scientific research approach that seeks to offer specific solutions. A wide range of topics puts emphasis on the needs of society aimed at circular economy, sustainable waste management, management of natural resources and their protection, environmental monitoring, introduction of renewable energy sources and climate change research.

Teachers of the Faculty of Geotechnical Engineering held a total of 8 lectures as guest lecturers at scientific institutions abroad (Skopje, Novi Sad, Naples, Ljubljana).

According to the Ordinance on Awards and Recognitions at the Faculty of Geotechnical Engineering, every year on the occasion of the Faculty Day, awards are given to the most productive scientists – the Award for Scientific Excellence, employees with scientific projects – the Award for Scientific Projects and the Recognition for Cooperation with the Economy.

Financial support is an integral part of encouraging the teaching and scientific research activities of teachers of the Faculty of Geotechnical Engineering. They are awarded continuously by the University of Zagreb, and at the Faculty of Geotechnical Engineering they are allocated to the scientific and teaching staff on the basis of the Decision of the Faculty Council for each academic year.

The Faculty of Geotechnical Engineering has intensified its efforts to attract more scientists and increase internationalization. According to the Records of International Mobility of the University of Zagreb, in the observed period, 11 scientists stayed at the Faculty of Geotechnical Engineering for up to 3 months and 1 for 6 months, through research mobility or as guest lecturers, from Portugal, Slovenia, the Czech Republic, Italy, Austria and Kosovo. Young scientists from different countries (Technical Academy of Sciences Prague, Federico II University of Naples) conducted research for their doctoral dissertations in the Laboratory of Environmental Engineering, which only confirms the high degree of scientific seriousness and competitiveness that the Faculty of Geotechnical Engineering offers at the international level.

Engagement of teachers of the Faculty of Geotechnical Engineering in the bodies of science and higher education:

Ordinal	Committee or body	Type of cooperation
1	Working Group for the Evaluation of Doctoral Thesis Topics, Technical Area Council, University of Zagreb	member
2	Croatian Agency for Science and Higher Education - Commission for Re-accreditation	member
3	Latvia University of Life Sciences and Technologies, Latvia - Commission for Re-accreditation	member
4	NAKVIS, College for Sustainable Development, Slovenia - Commission for Re-accreditation	member
5	Croatian Science Foundation, Panel for the Evaluation of Project Proposals	member
6	Sectoral Council XVI General Technical Sciences, ASHE	member
7	Parent Committee for the Field of Biology, Agency for Science and Higher Education	member
8	Parent Committee for the Fields of Chemical Engineering, Mining, Petroleum and Geological Engineering, Metallurgy, Textile Technology and Graphic Technology, National Council for Science, Higher Education and Technological Development	President, Members
9	Council of Natural Sciences, University of Zagreb	member
10	Working Group of Experts for the Drafting of Applications for the Entry of the Standard of the Comprehensive Qualification Environmental Engineer in Higher Education in the Register of the Croatian Qualifications Framework, Ministry of Science, Education and Youth	president
11	Working Group for the Evaluation of Doctoral Thesis Topics, Technical Area Council, University of Zagreb	member
12	Croatian Association of Innovators	members
13	Council of the Technical Area, University of Zagreb	members
14	Council of the Natural Sciences Area, University of Zagreb	members

Teachers of the Faculty of Geotechnical Engineering actively participate in the work of the editorial boards of scientific journals as editors-in-chief, members of the editorial board or guest editors, through membership in the editorial board of the journal published by the Faculty of Geotechnical Engineering and other high-ranking international journals such as Chemical Engineering Science, Sensors, Quaternary, Case studies in chemical and environmental engineering, Buildings, etc.

Teachers of the Faculty of Geotechnical Engineering of the University of Zagreb actively contribute to the development of the profession, the academic community and society through their participation in various committees and bodies. Their expertise and experience have been recognized in scientific and expert committees, sectoral councils and various committees at the level of the University of Zagreb and beyond. This broad engagement enables teachers, in addition to transferring knowledge to students, to significantly influence the development of higher education and science and contribute to social progress through various forms of professional cooperation and activities.

The Faculty of Geotechnical Engineering performs its teaching, scientific and professional activities in cooperation with external associates. The engagement of associates is carried out in accordance with the valid university and internal procedure of the Faculty of Geotechnical Engineering. All external associates who participate in the work of the Faculty of Geotechnical Engineering must meet national criteria and be elected to appropriate positions at their home institutions or at the Faculty of Geotechnical Engineering (title selection). External associates working at the Faculty of Geotechnical Engineering are recognized experts in their field and with their scientific and professional experience contribute to better interaction with students and teachers, which gives added value. CVs of external associates are attached.

ENVIRONMENTAL ENGINEERING JOURNAL

Since 2014, the Faculty of Geotechnical Engineering has been publishing the journal "Environmental Engineering", which contains scientific, professional and other papers in the interdisciplinary field of environmental engineering. The topics covered by the journal include geoengineering, water resources management, technical aspects of environmental protection and other similar areas of research.

Papers are accepted for publication after a positive review and are categorized as an original scientific paper, preliminary communication, review paper or professional paper.

Since 2019, the journal has changed its name from "Environmental Engineering" to "Environmental Engineering". In cooperation with the Croatian DOI Office, which mediates between Croatian publishers and the Crossref registration agency, the journal was awarded the DOI (Digital Object Identifier) digital object identifier. Since then, the journal has been published exclusively in English in digital format.

5.2 The higher education institution is recognizable for its professional achievements in all scientific fields in which it conducts professional studies

The quality of published professional papers of teachers is at the highest level.
The results of the teachers' professional research significantly contribute to the development of the profession.
The University has a satisfactory number of professional papers in prestigious professional journals.
The University has a satisfactory number of papers presented at prestigious professional conferences.
The higher education institution is involved in a satisfactory number of professional projects.
A higher education institution is an organizer of professional conferences that are nationally and internationally recognizable.
The higher education institution has organized publishing activities and is a publisher of professional publications important for the development of the profession.
Teachers of higher education institutions participate in the work of committees and other bodies important for the development of the profession.
External associates are recognized experts in their field, have relevant professional papers and relevant work experience.

In the Development Strategy of the Faculty of Geotechnical Engineering 2023 - 2027., as well as within the strategy at the state level, chapters related to scientific research and professional activities have been elaborated, and in accordance with them and the Quality Policy of the Faculty of Geotechnical Engineering, University of Zagreb, action plans are implemented in accordance with the needs of society and the labour market:

- National Development Strategy of the Republic of Croatia until 2030
- Digital Croatia Strategy for the period until 2032
- Strategic Plan of the Ministry of Science and Education for the period 2020 - 2022
- National Plan for the Development of the Education System for the Period until 2027
- Industrial Strategy of the Republic of Croatia 2021-2027
- Quality Assurance Policy of the Faculty of Geotechnical Engineering

Professional studies are not carried out at the Faculty of Geotechnical Engineering , but in accordance with Article 4, paragraph 3 and Article 5, paragraph 1 of the Statute of the Faculty of Geotechnical Engineering (2023), and accordingly, this chapter is not related to professional studies, but partly discusses the connection between the professional activity of the Faculty of Geotechnical Engineering and the economy. Some segments related to cooperation with the economy **are further elaborated in chapters 5.1 and 5.3.**

Given that the researchers of the Faculty of Geotechnical Engineering work in two basic scientific areas: technical sciences and natural sciences, and within several scientific fields and branches, interdisciplinary professional work of teachers and the impact on the economy and society as a whole are inevitable.

FOUNDATIONS OF PROFESSIONAL WORK

The professional work is based on Article 4 and Article 5 and on Articles 99 – 103 of the Act. of the Statute of the Faculty of Geotechnical Engineering and the Mission of the Faculty of Geotechnical Engineering, which recognizes the need for the transfer of knowledge and technologies acquired through scientific research into the economic sector and that through professional work (preparation of studies, studies, projects,...) it is necessary to achieve a strong interaction of theory and practice in order to improve the quality of the environment and achieve a contribution to the economy in the field of environmental protection.

Through professional work (preparation of studies, studies, projects...) The Faculty of Geotechnical Engineering achieves a strong interaction of theory and practice, which ultimately results in engineering solutions aimed at improving the level of quality of individual components of the environment and contribution to the economy in the field of environmental protection. In this way, the Faculty of Geotechnical Engineering strengthens ties with the region and is actively involved in the life and solving problems of the local community, especially through cooperation with the city of Varaždin and Varaždin County. All the experience and knowledge gathered through numerous projects are introduced into the teaching process, increasing the quality of teaching, and thus the competencies of our graduates (list of prominent projects with the economy).

Within the National Development Strategy of the Republic of Croatia until 2030 (NRS 2030), chapters related to the needs of society and the labour market have been developed. Strategic Goal 8 is also included in the 2030 Strategic Goals. "Ecological and energy transition for climate neutrality", within which "Protection of natural resources and the fight against climate change" is highlighted as one of the priority areas of public policies.

Considering the statements from the NRS 2030 that the environment is an integral and inseparable part of economic development and the aforementioned priority policies in the field of sustainable environment, it can be concluded that both the mission and the vision of the Faculty of Geotechnical Engineering are aligned with almost all of the stated priorities of the NRS 2030:

- increasing efficiency in municipal waste management and preparing for the transition to a circular economy
- quality and sustainable water management
- reducing air pollution and greenhouse gas emissions
- risk prevention, promotion of resilience and adaptation to climate change
- Development of circular management of space and buildings
- development of green infrastructure in urban areas and creation of green cities
- preserving and enhancing biodiversity and sustainable management of ecosystems, natural resources and biodiversity

In accordance with the above, the Development Strategy of the Faculty of Geotechnical Engineering for the development period from 2023 to 2027 contains a number of specific strategic goals related to the economy and professional activities, which are related to **the scientific research** and **development-professional field of work of the** Faculty of Geotechnical Engineering.

- **SCIENTIFIC RESEARCH AREA OF WORK**

Maintaining productivity while raising the quality of research and achieving national and international recognition and recognition is recognized as the general strategic goal of scientific research work at the Faculty of Geotechnical Engineering, which certainly includes a part of professional activities.

The laboratories established at the Faculty of Geotechnical Engineering (Geotechnical Laboratory, Laboratory for Environmental Geochemistry, Laboratory for Environmental Engineering, VIRTULAB), provide additional infrastructure in the system of support for research and transfer of knowledge and technologies, with the Geotechnical Laboratory being also an accredited laboratory. Laboratories are one of the basic material and technical resources for teaching, scientific research and professional activities at the Faculty of Geotechnical Engineering. The laboratories hold classes in many courses at the undergraduate and graduate level. Research within national and international scientific research projects in which the Faculty of Geotechnical Engineering participates as a holder or partner is also partly carried out in these laboratories.

The catalogue of laboratory equipment is available in the CRORIS database and is used to inform students, doctoral students, teachers, scientists and researchers of the Faculty of Geotechnical Engineering about the existence of various equipment, which improves the planning and execution of teaching, scientific research and professional work. In addition, the presentation of the Faculty of Geotechnical Engineering's equipment with instruments, devices, software packages and other tools enables existing, as well as interested external stakeholders from other higher education and scientific research institutions and the economy to have a better insight into the possibilities of the Faculty of Geotechnical Engineering and serves to encourage cooperation in working on future joint projects. Laboratories charge for their services in accordance with the price lists adopted by the Faculty Council.

One aspect of knowledge transfer to the economy is postgraduate doctoral studies, as described in more detail in Chapter 5.4.

- **DEVELOPMENTAL AND PROFESSIONAL FIELD OF WORK**

The development of human, financial and material resources necessary for the research and professional activities of the Faculty of Geotechnical Engineering is continuously carried out in order to strengthen competitiveness and better connections with leading economic entities. Spatial conditions and equipment are at the level of the European higher education standard, and continuous investments are made in space and equipment.

At the meeting of the Faculty Council in the academic year. 2023/2024, held on 13/12/2023, the Ordinance on the Procedure for the Selection and Promotion of Expert Associates (2023) was adopted, in order to formally regulate and regulate the recruitment procedure for professional positions: Expert Associate, Senior Expert Associate and Expert Advisor at the Faculty of Geotechnical Engineering. These are employees who were deprived of these opportunities due to previous legal solutions, and they are very important for the implementation of professional projects and for the maintenance of a part of teaching that does not require a scientific approach.

The improvement of the conditions for performing professional work at the Faculty of Geotechnical Engineering is also ensured by increasing the usability of equipment for professional work and increasing the usability of laboratory capacities, as well as the establishment of a sustainable model of maintenance and upgrade of infrastructure, laboratory equipment and equipment for professional work are key to improving the conditions for performing scientific research and professional work. In the past period, much equipment was purchased at the Faculty of Geotechnical Engineering through scientific research activities, which improved the quality of the teaching infrastructure. On this occasion, the following investments stand out:

- **One Sun Connecting North and South (ONESUN); EEA Grants –** solar panels and related equipment (EUR 35,474.25). Total 35,474.25 EUR
- **Management of karst coastal aquifers threatened by climate change (UKV); KK.05.1.1.02.0022 –** telemetry probes (EUR 34,426.64); workstation (EUR 1,009.98); LC/MS Q-ToF database (EUR 3,981.68); ArcGIS license for 5 people for 5 years (2,521.73). Total 41,940.03 EUR
- **Testing and modelling of the mechanical behaviour of bio-dried waste as a prerequisite for energy recovery – WtE; HRZZ UIP-2017-05-5157 -** upgrade of hydraulic edometer to three-axis device and services (36,498.77 EUR). Total 36,498.77 EUR
- **Recycled Rubber & Solar Photocatalysis: Ecological Innovation for Passive Air and Health Protection (RGSF); KK.01.1.1.07.0058 –** photocatalytic wind tunnel (EUR 13,257.02); Apparatus for the determination of gases in the air (EUR 53,089.12); components for the analysis of new recycled rubber materials (EUR 39,816.84); solar simulator (EUR 30,137.87); licences for programmes (EUR 1,254.23); a product life cycle assessment programme (EUR 7,962.54); air quality modelling programme (EUR 5,307.25). Total 150,824.87 EUR + services
- **Waste and the Sun in the Service of Photocatalytic Degradation of Micropollutants in Water (OS-Mi); KK.01.1.1.04.0006 –** hybrid Q-TOF (EUR 317,892.03); multi-zone tube furnace (EUR 12,910.94); ultrasonic homogenizers (EUR 15,686.08); small lab equipment (EUR 19,958.83); field equipment (EUR 14,623.41); upgrade of existing equipment (EUR 7,301.00); services EUR 6,598.86); computer (EUR 2,789.83); the COMSOL programme (EUR 5,188.60); investment maintenance (EUR 1,095.63); furniture (€277.20); protective equipment (EUR 3,290.33); equipment services (5,853.97). Total 413,466.71 EUR
- **VIRTULAB - Integrated Laboratory for Primary and Secondary Raw Materials; KK.01.1.1.02.0022 –** shredder (EUR 19,009.22); cutter (EUR 26,002.89); portable system for electrochemical measurements and impedance (EUR 6,740.66); portable modular UV/VIS spectrophotometer (EUR 7,918.57); portable gas analyser (EUR 10,119.95); device for extending the test capabilities of a triaxial and edometer instrument (EUR 60,823.34). Total EUR 130,614.63
- **Acquisition of key practical skills in the field of environmental engineering (SPIO); UP.03.1.1.04.0059 –** online system for monitoring and evaluation of professional practice GOSSIP (EUR 8,626.98); equipped multifunctional lecture room, IT classroom with new desktop computers and tablets, videoconferencing equipment smart board (EUR 26,544.56); established and equipped Makerspace (EUR 4,804.56); 3D printer and scanner, extruder (EUR 13,935.89); consumables for 3D printers (EUR 19,112.08); laboratories equipped with additional laboratory

equipment; device for soil analysis, gas chromatograph and educational packages (EUR 47,780.21). Total 120,804.28 EUR

- **Amplification of seismic soil motion caused by topographic effects in Northern Croatia - SIGMATOPCRO, HRZZ-IP-2022-1296**: 7 seismographs for continuous seismic monitoring (Geobit GEOtiny10) (EUR 31,875.00), multi-channel wireless geophysical system W2Z for geophysical surveys (EUR 25,937.50) and a set of equipment for geological surveys (EUR 848.75). A total of EUR 58,661.25.

STRENGTHENING LOCAL AND REGIONAL COMPETITIVENESS

The strengthening of the local and regional competitiveness of the Faculty of Geotechnical Engineering also contributes to the projects in which the Faculty of Geotechnical Engineering seeks to be involved. Below are some of them.

- **Flexible and smart energy systems to decarbonise buildings (Bilateral initiative; The EEA and Norway Grants).** The partner in this activity was SINTEF Energy Research, Department of Thermal Energy, and the key activity was the preparation of a preliminary study for the replacement of a gas boiler with a heat pump in combination with a "thermal" battery with PCM, i.e. the development of specifications for raising the standard of the GFV building towards a 'smart building' – "Zero emission buyings" - ZEB, "Smart building".
- **One Sun Connecting North and South (ONESUN); The EEA and Norway Grants.** The activity was aimed at increasing the production of electricity from solar energy and strengthening cooperation between Croatian and Norwegian partners and the academic community. An exchange of experiences was established with the University of Stavanger in Norway, with which the GFV also signed a cooperation agreement. As part of the project, GFV installed a photovoltaic power plant, which was commissioned during December 2023. Calculated annually, the reduction in emissions is 65% or 7,135.10 kg of CO_2. Expected production is 44,988 kWh or about 11,000 EUR annual savings on electricity bills.
- **SIGMATOPCRO (Amplification of seismic soil motion caused by topographic effects in Northern Croatia; HRZZ IP-2022-10-1296).** An important aspect of the project is the creation of a structured database with all relevant information, data, results and microzonation maps that can be used as a guideline for future research and applications and that will be available to everyone. In addition to a significant scientific contribution, a very important contribution is expected in the local community and raising social and public awareness of earthquakes through joint activities with the Civil Protection Office of Northern Croatia, the Seismological Service of Croatia, city planners, the construction profession as well as with the sections of the Ordinariate of the Diocese of Varaždin.
- **MAURICE (Interreg Central Europe project Management of urban water resources in Central Europe facing climate change).** The project focuses on Climate change that threatens the availability of water resources in Central Europe, and regions need to increase resilience to urban droughts, floods and groundwater depletion. The project aims to improve the resilience of regions to climate change through the development of joint solutions for the management of urban water

resources. Transnational cooperation will enable knowledge transfer, reduce barriers and foster local policies in climate change adaptation, especially in the context of urban water systems. The partnership brings together 11 stakeholders: Central Mining Institute, Katowice, Poland; City of Jaworzno, Poland; City of Stuttgart, Germany; Novy Bydzov Castle, Czech Republic; Technical University of Liberec, Czech Republic; Polytechnic University of Milan, Italy; East Ticino Villoresi Reclamation and Irrigation Consortium, Italy; Geological Survey of Slovenia, Slovenia; JP VOKA SNAGA (Water Supply and Sewerage) Ljubljana, Slovenia; University of Zagreb, Faculty of Geotechnical Engineering, Croatia; City of Varaždin, Croatia.

PROFESSIONAL MEETINGS

- **Round table "Sediment in water systems"** on 20 November 2020 in cooperation with the Croatian Hydrological Society, the Croatian Society for Drainage and Irrigation, the Croatian Water Protection Society, Varaždin County and the City of Varaždin
- **Final conference of the infrastructure project "VirtuLab** - Integrated Laboratory for Primary and Secondary Raw Materials" 08 July 2021
- **Final online workshop "Flexible and smart energy systems to decarbonize buldings"** 13 March 2024; the project was implemented in cooperation with the Norwegian institute SINTEF; more than 130 participants participated; the attendees were greeted by the Ambassador of the Kingdom of Norway to the Republic of Croatia and the Vice-Rector of UniZG
- **Joint final conference of two projects funded by Norway Grants**: "One Sun Connecting North and South" (ONESUN) and "Solar Roofs for Green Virovitica" (Green VTC); On 11 April 2024, the attendees were also greeted by the Ambassador of the Kingdom of Norway to the Republic of Croatia and the Vice-Rector of UniZG
- **Round table on the topic "Earthquakes in Northern Croatia"** held on 16 April 2024 as part of the HRZZ project SIGMATOPCRO. The conference was attended by 116 participants from various counties, cities, municipalities, institutions, a number of services, associations, as well as students of the Faculty of Geotechnical Engineering. The attendees were greeted by the prefect of Varaždin County, Anđelko Stričak.
- **International Symposium Waste Management Zagreb (2022, 2024).** This symposium is a traditional gathering place for experts and scientists in the field of waste management from Southeast Europe, which is organized in co-organization with the Faculty of Geotechnical Engineering.
- **Crisis Management Days, (2024, 2025)** – scientific and professional conference, Tuhelj, Faculty of Geotechnical Engineering is a partner
- **European GREEN Conference** – EGC (2023, 2024, 2025) The Faculty of Geotechnical Engineering is a co-organizer – an international conference that emphasizes the importance of a multidisciplinary approach in solving challenges related to climate change, environmental protection and the implementation of sustainability guidelines. Final online workshop of the project "Flexible and smart energy systems to decarbonize buildings"; the project was carried out in cooperation with the Norwegian institute SINTEF; more than 130 participants participated; the attendees were greeted by the Ambassador of the Kingdom of Norway to the Republic of Croatia and the Vice-Rector of the UniZG.

5.3 A higher education institution influences the economy and society as a whole through the scientific and/or artistic work of its teachers.

Higher education institutions have appropriate mechanisms for the dissemination of its activities to society.
The higher education institution has developed cooperation with external stakeholders.
The higher education institution participates in the design of public policies in the context of the scientific field and the field in which Acts.
HEI teachers are involved in various scientific or management bodies, national and international.
HEI teachers participate in national and international reviews of projects, programmes and scientific papers.

DISSEMINATION ACTIVITIES

The Faculty of Geotechnical Engineering is constantly developing the system of promotion in society, in order to emphasize its presence as much as possible in order to present the achieved results and announce future activities, which serves the further integration of the Faculty of Geotechnical Engineering into all economic flows. The Faculty of Geotechnical Engineering is also actively working on its positioning in society in order to be able to promote the values it develops, and which are in line with its mission, vision and strategy as efficiently as possible.

At the Faculty of Geotechnical Engineering, the Working Group for Promotion is in charge of promotional activities, which organizes and implements various programs and promotion activities. This includes, among other things, the organization, preparation and coordination of numerous activities.

Events within the Faculty:

- Day of the Faculty
- „Open House Day“ (several times during the year)
- Day & Night in Environmental Engineering
- Career Day in Environmental Engineering
- Popular Wednesday events
- numerous workshops for elementary and high school students in the STEM centre
- organization of popular science lectures, workshops and forums
- regular celebration of World Environment Day as a basic thematic event intended for the interested public
- celebration of events related to environmental topics and science: International Day of Women in Science (February), World Water Protection Day (March), Earth Day (March), Renewable Energy Day (March)

Events outside the Faculty:

- regular annual tour of secondary schools in order to familiarize high school students with the opportunities that open up to them by enrolling, studying and graduating from the Faculty of Geotechnical Engineering
- participation in career fairs organized by high schools
- popular science lectures in secondary schools related to environmental topics

- University of Zagreb Exhibition
- EXPO Exhibition Dubrovnik
- Balkan EDU EXPO (Sarajevo)
- MUZZA Science Week
- Participation in innovation fairs (e.g. ARCA, AgroARCA...)
- Science Festival
- Science Picnic

PARTICULARLY PROMINENT DISSEMINATION ACTIVITIES

- **STEM Centre Activities**

Throughout the year, numerous workshops for elementary and high school students were held at the STEM Centre for Children and Youth. We are visited by more and more high school classes from Varaždin County and children of lower and higher grades of elementary schools. Co-financing of the workshops was obtained by the Varaždin County, and the donation was spent on consumables and bus transport from the school to the GFV. In addition to the area of Varaždin County, the STEM Centre was also visited by schools from Međimurje County, Karlovac County and Istria County.

- **Regular celebration of World Environment Day in Varaždin**

World Environment Day is the most important international day dedicated to the promotion of environmental protection, and has been held every June 5 since 1973 within the United Nations Environment Programme (UNEP) as World Environment Day.

The Faculty of Geotechnical Engineering, in co-organization with the Faculty of Organization and Informatics and the Faculty of Textile Technology, began with the organized celebration of this event in the Republic of Croatia, i.e. in Varaždin in 2021, and it was successfully held in 2022, 2023, 2024 and for the fifth time in 2025, which is certainly a guarantee that this event has successfully come to life both locally and in the wider community. Students and teachers present their research and the role of the individual in environmental protection, and the event is intended for all ages of children, from kindergarten to high school students, in order to get acquainted with environmental protection through educational content, interactive quizzes and experiments. This is also an opportunity for graduates to get to know individual study programs and decide to continue their education in Varaždin. The event is supported by the University of Zagreb and the Student Centre in Varaždin, Varaždin County, the City of Varaždin and numerous related public institutions.

- **Popular science lectures in high schools**

From 2023/2024, popular science lectures covering various topics in the field of the environment are conducted in secondary schools, e.g. Water - an indicator of the state of the environment; Earthquakes and the environment; The importance of mineral raw materials for the life and survival of human civilization; Environmental impact of lithium mining; Is there science in waste?; Green transition and decarbonization; The Sun as a Source of Purity; The impact of climate change on landslide formation; Bees - irreplaceable helpers in preserving the environment; Application of Artificial Intelligence in Environmental Engineering and Hydrology – Example Letter 2023/2024 and 2024/2025.

By doing so, we spread awareness and knowledge about the environment and point out the multidisciplinary of this field, which is in line with the mission of our Faculty – a commitment to the study and promotion of environmental sciences and engineering related to environmental issues, in order to ensure that new generations of young people have the opportunity to understand and appreciate the complex aspects of the environment and to actively participate in its conservation.

- **Selection of high schools that allow direct enrolment of students in GFV**

Selected high schools from the territory of the Republic of Croatia have the right to choose their students for direct enrolment in the 1st year of the university undergraduate study of Environmental Engineering at the Faculty of Geotechnical Engineering, which is described in Chapter 3.3. The secondary school selects and proposes its students completely independently, based on its own knowledge and criteria of excellence and applying the principle of impartiality

- **Involvement in ESF programmes related to strengthening civil society organisations for the promotion of STEM fields**

As part of the ESF call for projects under the *Strengthening the Capacity of Civil Society Organizations for the Promotion of STEM program*, as many as five project proposal applications were prepared in preparation during 2024/2025, in which the Faculty of Geotechnical Engineering participates as a partner: Don't be a stemer, be a stemer, STEP for STEM, Green 4 Urban, MUZZA STEM Academy, Water - a drop in the palm of your hand of Varaždin County.

Two ESF projects have been approved for funding in the current call and are already being implemented: STEP for STEM and MUZZA STEM Academy.

- **STRONGER POSITIONING AND INTERNATIONAL AFFIRMATION OF ENVIRONMENTAL ENGINEERING**

It is provided through the (co)organization of professional conferences related to the topics of environmental engineering; organization of forums, workshops and round tables, media popularization of activities, participation in decision-making of public interest in the field of environmental protection, which is more discussed in Chapter 5.2 related to Expert Conferences.

- **SOCIAL ENGAGEMENT AND VOLUNTEERING**

The social sensitivity of students and teachers of the Faculty of Geotechnical Engineering is significant, as they are readily engaged in volunteer work and charity actions, such as voluntary blood donation, collecting donations for those in need in case of natural disasters and gifts for children in children's homes.

COOPERATION WITH EXTERNAL STAKEHOLDERS

The Faculty of Geotechnical Engineering has developed cooperation with external stakeholders and strong cooperation with the economy, the public sector and international partners. This cooperation includes the application of research results and involvement in major scientific research and development projects. The Faculty of Geotechnical Engineering already has experience in the

implementation of projects financed from EU funds and actively cooperates with external experts, and the professional work of teachers is continuously encouraged, which is reflected in numerous professional projects, participation in expert opinions, presence at professional conferences, workshops and round tables from the profession.

The Faculty of Geotechnical Engineering is actively involved in professional projects, which enable the application of scientific research in practice, as well as the encouragement of cooperation with the economy. Establishing cooperation with leading economic entities, public and state institutions in the Republic of Croatia and abroad, and the local community contributes to the transfer of knowledge from research and development to industry, which increases the competitiveness of the Faculty of Geotechnical Engineering in the wider social context. The Faculty of Geotechnical Engineering encourages cooperation with the economy not only for the transfer of knowledge from research and development to the economy, but also for the purpose of increasing its own revenues, which establishes a sustainable model for the maintenance and upgrade of infrastructure, laboratory equipment and equipment for professional work.

Encouraging cooperation with the economy and the public sector is ensured by applying research results and engaging in major scientific research and development projects. The employees of the Faculty of Geotechnical Engineering are proven experts in their specialized fields, and they actively transfer the knowledge acquired through scientific research to solve environmental problems at the national and international level. Such an approach enables the Faculty of Geotechnical Engineering to profile itself as an important stakeholder in the processes of solving local, regional and national traffic issues, all with the aim of sustainable development and environmental protection.

In **Table 5.6. The analytical annex** lists the projects in the last 5 years. Table 5.6 shows that the most important professional project was the project One Sun Connecting North and South (OneSun)EEA and Norway support from the Fund for Regional Cooperation / Strengthening bilateral cooperation with Norway in the Green Transition.

Some of the isolated cooperation agreements from the previous period are:

- Bilateralni agreement s University of Stavanger 2022
- Agreement Flexible and smart energy system - SINTEF energy i SINTEF Energy Research ILN 2022
- OneSun Partnership Agreement 2022
- Cooperation agreement with Algebra 2022
- InTering CENTRAL EUROPA MAURICE Agreement 2023.
- Agreement on participation in the e-Universities project CARNET 2023
- Drava Life Hrvatske Vode Cooperation Agreement 2023
- Hrvatske Vode Agreement in principle on mutual relations 2024

In the past period, the Faculty of Geotechnical Engineering has concluded a number of agreements related to the implementation of professional practice, over 30 of them (List of agreements on the implementation of professional practice), as well as special agreements on the implementation of professional practice at a permanent site with: Gumiimpex - GRP d.o.o., HGI-CGS, Geokol, SPP, Public Institution of Plitvice Lakes National Park, Premifab.

Employees of the Faculty of Geotechnical Engineering are members of the organizing committees of scientific and professional conferences and are members of the editorial board of journals

- the list of organizing committees of scientific conferences in which teachers of the Faculty of Geotechnical Engineering participate is shown in Table 5.7. Analytical Contribution, and the list of editorial boards in journals in Table 5.8.

Through the activities of its employees, the Faculty of Geotechnical Engineering closely cooperates with the following professional associations:

- Croatian Geological Society (HGD), International Association of Hydrogeologists (IAH), International Association of Engineering Geology (IAEG), Croatian Society for Water Protection (HDZV), Croatian Hydrological Society (HHD), Croatian Association for Geothermal Energy (HUGE), Croatian Association of Civil Engineers (HSGI), Croatian Waste Management Association (HUGO), Croatian Society of Chemical Engineers and Technologists (HDKI), Croatian Chemical Society (HKD), Croatian Geotechnical Society (HGD-CGS), International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), International Society for Rock Mechanics and Rock Engineering (ISRM), Croatian Society of Geotechnical Engineers (HDIG), etc.

- **COOPERATION WITH THE ECONOMY FOR KNOWLEDGE TRANSFER**

Cooperation with the economy due to the transfer of knowledge from research and development to the economy and for the purpose of increasing its own revenues was additionally put in focus at the session of the Faculty Council in 2023/2024 held on 20 March 2024, when the Decision on Intellectual Property Management at the Faculty of Geotechnical Engineering (2024) was adopted, which regulates the treatment of intellectual creations and fully accepts the provisions of the of the Ordinance on Intellectual Property Management at the University of Zagreb (2022) and the Guidelines for Intellectual Property Management at the University of Zagreb (2022). A Decision was made on the appointment of the Head of the Technology Transfer Office (2024) with the following responsibilities: innovation and intellectual property management in accordance with the Decision on Intellectual Property Management at the Faculty; assistance in technology mapping and preparatory activities for entering the market; advisory services intended for students, scientists and entrepreneurs with the aim of strengthening cooperation between science and business; assistance in the preparation of tenders for professional affairs and the implementation of projects in the segment of knowledge and technology transfer.

More at: https://www.gfv.unizg.hr/static/ured-za-transfer-tehnologija

- **COOPERATION WITH GRADUATE ASSOCIATIONS**

The Faculty of Geotechnical Engineering maintains constant contact with associations of graduate students, and they jointly cooperate on promotional and project activities and activities to raise the reputation of the profession. Most of the cooperation was achieved with three Associations: the Association of Graduates of the Faculty of Geotechnical Engineering (AMAC-GFV), the Croatian Society of Geotechnical Engineers (HDIG) and the Croatian Society for Environmental Engineering (HDIO).

Especially active was the cooperation with the AMAC-GFV association, which was involved in several promotional activities that took place at the Faculty of Geotechnical Engineering; some of them are Summer Day at GFV, Warming up GFV, Autumn Day at GFV, Career Days. AMAC-GFV, HDIG and HDIO actively participated in joint applications and implementation of projects to improve the conditions of students and studies, such as ESF project UP.03.1.1.04.0059 "Acquisition of key practical skills in the field of environmental engineering" and ESF project UP.04.2.1.10.0076 "STEM centre for children and youth". Also, members of the Associations actively participated in the development of the standard of the profession of environmental engineer.

- **ECONOMIC COUNCIL**

The Economic Council of the Faculty of Geotechnical Engineering, in accordance with Art. 27 of the Statute of the Faculty of Geotechnical Engineering (2023), a special advisory body to the Dean.

Preparations are underway for the establishment of the Economic Council, which is planned to be formally established in 2025/2026 after all processes related to the selection of members of the future advisory body are completed. As a rule, the members of the Economic Council will be representatives of prominent legal entities from the economy. The decision on the appointment of the members of the Economic Council and the duration of their term of office is made by the Dean, and the dynamics of meetings are defined by the members of the Economic Council in cooperation with the Vice-Dean for Business.

The establishment of the Economic Council will make significant progress in cooperation with the economy through the members of the Council. The areas on which the Economic Council will focus its work will be closely related to the improvement of the work of the Faculty of Geotechnical Engineering and to the fulfilment of the vision of the Faculty of Geotechnical Engineering to be confirmed at the national level as the leading scientific and educational higher education institution specialized in higher education, scientific and professional work in the field of environmental engineering, especially those of its segments that are focused on identification, designing, building and managing systems for solving environmental protection problems, i.e. problems related to soil, water and air pollution, then waste management problems and defining environmental protection mechanisms.

The Economic Council will first be involved in:

- determining the needs of the economy and accordingly in the development of curricula and the teaching process, depending on the needs of the labour market
- joint determination of the topics of graduate theses, scholarships for students, organization of professional practice, etc.
- joint identification of research areas and topics and their joint (co)financing, which will ensure development, innovation and direct transfer of knowledge through better networking and mutual communication.

- **OCCUPATIONAL STANDARD IN LINE WITH THE NEEDS OF THE ECONOMY**

Since the development of occupational standards was transferred from the burden of employers to the burden of higher education institutions, accordingly, during March 2021, activities were launched at the Faculty of Geotechnical Engineering for the purpose of preparing and developing occupational

standards and qualification standards. At that moment, the activities were directed towards two occupational standards: one related to Geoengineer and the other to Environmental Engineer. Given that by April 2021 all activities related to the profession of "environmental engineer" were agreed, its development began.

During May 2021, the Instructions for the work of the expert group for the development of occupational standards were defined, in accordance with the then valid Methodology for the development of occupational standards of the Ministry of Labor and the Pension System.

A Group of Experts has been appointed for the development of a proposal for the occupational standard "Environmental Engineer", taking into account that it must necessarily consist of: a representative of employers employing the profession, a worker in the profession, a representative of the education system participating in education and training for the profession (including mentors at employers with whom the practical part of the vocational curriculum or professional practice is carried out), experts from the educational and scientific system, and a representative of a professional chamber or occupational association.

A Working Group has been appointed for the preparation of materials related to the development of occupational standards "Environmental Engineer" and coordinators in charge of harmonizing the work of the Working Group and the work of the Group of Experts for the development of proposals for the occupational standard "Environmental Engineer", in such a way that the final content is adapted and optimized for the profession "Environmental Engineer", taking into account the Methodology for the Development of Occupational Standards, prescribed by the Ministry of Labor and Pension System.

The necessary annexation of employers was carried out at the beginning of 2022 and a report on the surveys was available in March, and at the end of March 2022. A public forum was held at which the coordinators in charge of harmonizing the work of the Working Group and the work of the Group of Experts presented activities related to the development of occupational standards: CROQF methodology, the current course of development and input settings for the development of the occupational standards "Environmental Engineer".

After submitting the proposal for evaluation, the entire procedure was completed at the beginning of 2023 after several iterations, and the Decision on Registration of 17 March 2023 successfully entered the occupational standard "Environmental Engineer" in the CROQF Register, which also guarantees the necessity and recognition of this profession in the Republic of Croatia by the Republic of Croatia (https://hko.srce.hr/registar/standard-zanimanja/detalji/468)

The newly enrolled occupational standard is largely harmonized with the European Classification of Occupations (ESCO), which puts the ESCO profession of Environmental Engineer on an equal footing with already recognized and partly related professions in the Republic of Croatia.

ACTIVITIES RELATED TO THE DESIGN OF PUBLIC POLICIES

The Faculty of Geotechnical Engineering participates in the design of public policies in the context of the scientific field and the field in which it operates, and is actively involved in various initiatives at the national and international level, such as launching an initiative to open a new scientific field – Environmental Engineering.

In occasional working meetings, the Management of the Faculty of Geotechnical Engineering reports on its activities to the Rector and the Agency for Science and Higher Education (example of the meeting held in 2021 at ASHE).

Employees are regularly informed about the most important initiatives and public discussions related to the activities of the Faculty of Geotechnical Engineering, and are officially invited to participate in them. Below are examples of some of the activities:

- Public Debate on the National Criteria for Scientific and Teaching Positions - Public Debate
- Proposals of candidates for members of the National Council for Higher Education, Science and Technological Development; proposing candidates for members of the relevant parent committees – in this case, it resulted in the successful selection of our two full professors (Decision related to the Parent Committee for the field of biology and Decision related to the parent committee for the field of chemical engineering, mining, petroleum and geological engineering, metallurgy, textile and graphic technology)
- Public Hearing on the Proposal of the Ordinance on the Allocation and Recognition of ECTS Credits for Extracurricular Activities of the University of Zagreb – Comments of the Faculty of Geotechnical Engineering; Public Debate on the Draft Ordinance on Lifelong Learning of the University of Zagreb – Comments of the Faculty of Geotechnical Engineering; Public Hearing on the Draft Ordinance on the Procedure for the Evaluation of Study Programmes of the University of Zagreb – Comments of the Faculty of Geotechnical Engineering.

The Faculty of Geotechnical Engineering is also regularly engaged in the adoption of the necessary regulations at the competent ministries for regulating the status of graduate students. Through its activities in environmental protection, water management, geotechnics and similar areas, thus contributing to the design of public policies related to environmental protection, renewable energy sources, decarbonization and other global challenges.

Below are several initiatives of the Faculty of Geotechnical Engineering, which have particularly marked the period since the last re-accreditation.

- **INITIATIVES TO OPEN A NEW SCIENTIFIC FIELD OF ENVIRONMENTAL ENGINEERING**

During October/November 2023, the Ministry of Science and Education sent the Proposal of the Ordinance on Scientific Interdisciplinary Fields, Fields and Branches and the Artistic Field, Fields and Branches for public consultation and invited all interested public to participate in the consultation.

Through public consultation, the Faculty of Geotechnical Engineering proposed that the scientific branch 02.16.1 Environmental Engineering be defined as a scientific field and that it be listed as such in Article 3 of this Ordinance within the field of technical sciences. We have also proposed that the following scientific branches be defined within the newly proposed scientific field: Management of the Environment and Sectoral Pressures, Water Management, Geoenvironmental Engineering and Geohazards, Waste Management.

The Faculty of Geotechnical Engineering requested the support of the Council of the Technical Area of the University of Zagreb (VTP), which was obtained in such a way that the VTP also supported the proposal of the Faculty of Geotechnical Engineering in the public consultation. The proposed initiative

of the Faculty of Geotechnical Engineering was also supported through public consultation by: AMAC-GFV, the Croatian Society of Geotechnical Engineers and the Croatian Society for Environmental Engineering.

Upon completion of the public consultation, all proposals were rejected by the Ministry of Science and Education without accompanying explanations or arguments, and with the comment that the Proposer stands by the proposed normative solution. This leaves the Faculty of Geotechnical Engineering to continue its efforts to promote Environmental Engineering, with the help of the University of Zagreb, into a scientific field in the future.

This situation is similar to the one in which the Faculty of Geotechnical Engineering found itself in 2009. Namely, back in 2005, the inclusion of Environmental Engineering in the Ordinance on Scientific and Artistic Fields, Fields and Branches was initiated at the initiative of the Faculty of Geotechnical Engineering. The initiative was then also supported by the Council of the Technical Area of the University of Zagreb, and the proposal to open the scientific field of Environmental Engineering, together with other proposals of the University of Zagreb, was sent to the National Council for Science, which was then drafting the then new Ordinance on Scientific and Artistic Fields, Fields and Branches. In the final version of the Ordinance from 2009, Environmental Engineering became a scientific branch within the scientific field 2.16 instead of a scientific field without specific explanations. Interdisciplinary Technical Sciences.

- **INITIATIVES REGARDING THE RESPECT OF PROFESSION AND PROFESSIONAL QUALIFICATIONS**

Activities related to the appreciation of the profession and professional qualifications of univ. bacc. ing. amb and univ. mag. ing. amb. when announcing public tenders, they were prompted by the feedback from our alumni that the State Inspectorate of the Republic of Croatia (DIRH) rejected the tender announced for the jobs of environmental protection inspectors in December 2023 for administrative reasons, i.e. refused to take it into account with the explanation that they do not meet the formal requirements of the competition for admission to the civil service, do not have the appropriate profession and professional qualification in the field of technical sciences prescribed by the competition.

In communication with the DIRH and after the request for respect of the profession was sent, a positive response was very quickly received from the DIRH stating that during the adoption/amendments to the Law on the State Inspectorate and in the internal acts on the systematization of jobs for performing the duties of environmental protection inspectors, the academic title of univ. mag. ing. amb. (University Master of Science in Environmental Engineering). This also resulted in successful cooperation with our alumni who pointed out the direct problem they face after graduating from the Faculty.

Accordingly, similar letters were sent in the first half of 2024 to over a hundred public and private stakeholders with a request for the profession and professional qualifications of univ. bacc. ing. amb and univ. mag. ing. amb., i.e. university studies in the field of technical sciences, the field of Interdisciplinary Technical Sciences, branch of Environmental Engineering (Ordinance on Scientific and

Interdisciplinary Fields, Fields and Branches and the Art Field, Fields and Branches, OG 3/2024), should be taken into account when announcing public tenders in such a way that, if they have not already been announced, they are included in the internal acts on the systematization of jobs, and in order to open the possibility that when announcing vacancies for jobs in the technical field, our graduates can also apply and compete for vacancies that are advertised.

- **INITIATIVE TO INITIATE A PROFESSIONAL EXAM IN THE FIELD OF ENVIRONMENTAL PROTECTION**

During October 2022, based on several inquiries from graduates, the Inquiry to the Ministry of Economy and Sustainable Development was repeated, regarding the taking of professional exams in the field of environmental protection, in accordance with Art. 47 of the Environmental Protection Act (OG 80/13, 153/13, 78/15, 12/18, 118/18) because the professional exam is taken at the Ministry and is conducted by a commission established by the Minister by a decision.

At the beginning of 2023, we received the Ministry's response that the regulations that precede the professional exams are being drafted and that we will be informed of all steps in a timely manner and that our requests and suggestions will be taken into account when drafting the regulations in question. Specifically, it is the Ordinance on the Issuance of Approvals for the Performance of Professional Activities, the Content and Manner of Keeping the Register of Issued Approvals (in accordance with Article 40, Paragraph 9 of the Act). of the Environmental Protection Act) and the Ordinance on the Program, Conditions and Manner of Taking the Professional Exam, as well as the Completion and Improvement of the Knowledge of Persons Who Have Passed the Professional Exam for Performing Tasks in the Field of Environmental Protection (in accordance with Article 47, paragraph 5 of the Environmental Protection Act). of the Environmental Protection Act).

- **INITIATIVES TO CHANGE THE NAME OF THE FACULTY IN SUCH A WAY AS TO ENSURE CLEAR RECOGNITION WITH ENVIRONMENTAL ENGINEERING**

In the period since the last re-accreditation, the name of the Faculty of Geotechnical Engineering has not been changed in such a way as to ensure clear recognition in the interdisciplinary technical field related to environmental engineering, because the necessary support from the University of Zagreb has not been obtained for this.

Over time, there have been several initiatives and attempts, so that before the initiation of the new name change procedure, which continued on the activities started in the previous re-accreditation cycle, an Analysis of the situation was made , which included previous attempts as well as an analysis of the arguments that we consider to be justified in our long-term effort to change the name. After that, during 2021, the Proposal was elaborated and presented at the Council of the Technical Area of the University of Zagreb, and with the consent of the Rector of the University of Zagreb, at the session of the Faculty Council held on 13 April 2022, a statutory Decision on the change of the name of the Faculty of Geotechnical Engineering was adopted, which then received a positive opinion of the Committee on Statutory Issues University of Zagreb. After that, the item related to the statutory change of name was included as item no. 17. in Invitation and agenda of the 13th regular Session of the Senate of the University of Zagreb in the academic year 2021/2022. convened for 24 May 2022.

However, in the end, the name change did not take place because the item was removed from the agenda just before the beginning of the Senate session, which is also evident from the Minutes of the 13th regular Session of the Senate of the University of Zagreb in the academic year 2021/2022. According to our knowledge, this was preceded by only one e-mail from one dean of another constituent part of the University of Zagreb, to which we reacted.

Ultimately, the Faculty of Geotechnical Engineering has to continue with its efforts and to achieve this with the help of the University of Zagreb in the coming period.

TEACHER ACTIVITY

The teachers of the Faculty of Geotechnical Engineering are involved in various scientific or governing bodies, national and international. The Faculty of Geotechnical Engineering has a significant involvement of its teachers in various scientific and governing bodies, both nationally and internationally. The Faculty includes international experts in its work through the International Advisory Board, thus ensuring participation in high-level management and consulting. Faculty teachers also participate in national and international scientific committees, as well as in international and national projects related to environmental engineering, geotechnics and hydraulic engineering. This cooperation enables the Faculty to be an active participant in the design and implementation of new scientific approaches and technologies in its scientific field. This created the preconditions for greater visibility and recognition of the activities of the scientific, teaching, associate and professional staff of the Faculty of Geotechnical Engineering.

The visibility of dissemination activities is further emphasized by participation in innovation exhibitions, but also by the recognition of research areas and individuals through awards. In the period from 2020 to 2024, the employees of the Faculty of Geotechnical Engineering received 4 awards for innovations based on scientific research and professional activities. It should be emphasized that, in accordance with financial possibilities, teachers and associates actively participate in the ARCA International Exhibitions of Innovations. Also, the "Fran Bošnjaković" award of the University of Zagreb was awarded. This annual award is given to individuals in Croatia and abroad for scientific results, promotion of scientific discipline and profession, and knowledge transfer, especially the education of young experts in the field of technical sciences of the University of Zagreb.

In addition to the basic tasks in teaching, scientific research and professional activities, employees contribute to the local and wider community through involvement in professional and public bodies (see Chapter 5.1) through which the employees of the Faculty of Geotechnical Engineering promote and improve their activities and influence the creation of public policies by invitation and appointment. Teachers of the Faculty of Geotechnical Engineering participate in national and international reviews of projects, programs and scientific papers. Teachers of the Faculty of Geotechnical Engineering regularly participate in reviews of scientific papers and projects at the national and international level. This internship includes evaluation and consulting regarding projects funded by EU funds, as well as within other international initiatives and research programs. The Faculty promotes the active participation of its teachers in scientific reviews and evaluations as a way to strengthen the quality of its research and teaching and enables a high level of professional participation in relevant review processes.

5.4 Doctoral studies of higher education institutions are aligned with the strategic program of the higher education institution, contemporary scientific/artistic achievements, professional standards and internationally accepted standards of quality doctoral education, where applicable.

Planning and proposing doctoral studies are aligned with the mission and strategic goals of the higher education institution.
Planning and proposing doctoral studies contribute to the national development of higher education and sciences.
Doctoral studies and doctoral theses reflect scientific research and achievements of higher education institutions.
Doctoral studies of higher education institutions follow the latest scientific knowledge and skills based on it.
Doctoral studies of higher education institutions are aligned with the standards of the profession and modern achievements in this area.
The University encourages creativity in the creation of new doctoral studies.

The doctoral study of Environmental Engineering is designed in accordance with the mission and vision of the Faculty of Geotechnical Engineering, which emphasizes the implementation of scientific research and higher education based on it in the interdisciplinary field and the transfer of knowledge to the economy.

The doctoral study of Environmental Engineering is clearly designed in accordance with the mission of the GFV, which is based on the development of high-quality education and scientific research work in the field of environmental engineering, with responsibility towards society and the environment. The study of the doctoral study and the GFV Development Strategy 2023–2027 emphasize the need for an interdisciplinary approach, contribution to sustainable development and strengthening of scientific excellence, which this study specifically achieves, which is also evident through the thematic units it covers: Sustainable Waste Management, Water Management, Environmental Geoengineering, Environment and Nature, and Energy. The study is designed to respond to GFV's key strategic objectives, including:

- improvement of scientific research activities, which is carried out through scientific research projects employed by assistants who enrol in doctoral studies and do their research for doctoral thesis;
- internationalization of studies through cooperation with institutions from Croatia, Slovenia, Italy and Austria, either through the engagement of external associates or through study visits and international exchange of teachers and doctoral students;
- developing the competencies of doctoral students focused on contemporary challenges in the field of the environment, with a special emphasis on connecting theory and practice.

In accordance with the GFV's Scientific Research Strategy, the study also contributes to strengthening the competitiveness of faculties on the European research scene, as it offers content aligned with EU priorities and develops staff ready to work on international projects and in research and development institutions. In this way, the doctoral study not only contributes to the academic development and scientific recognition of the faculty, but also actively supports its strategic orientation towards sustainability, innovation and knowledge transfer to society and the economy. Encouraging cooperation with the economy is also indicated by the fact that out of 55 total enrolled doctoral

students in 6 generations, as many as 20% of enrolled doctoral students in the 7 years of the program were employed in the economy.

The Doctoral Study of Environmental Engineering is a unique study of its kind in the Republic of Croatia and thus contributes to national development by educating experts trained to solve key and increasingly serious environmental challenges, thus strengthening the capacity of science and innovation. It also encourages interdisciplinary collaboration and knowledge transfer to industry and the public sector.

The planning and launch of the doctoral study of Environmental Engineering at the Faculty of Geotechnical Engineering responds to the strategic needs of the Republic of Croatia in the field of sustainable development, environmental protection and green transition. The study is directly aligned with the priorities defined in the Smart Specialization Strategy of the Republic of Croatia (S3), the EU Green Deal and national strategic documents in the environmental and economic sector. Through clearly defined scientific topics (e.g. water and waste management, energy efficiency, decarbonization, circular economy), the study encourages the creation of highly educated staff capable of solving contemporary challenges in an interdisciplinary environment and enables the transfer of knowledge to the real sector. That is why the doctoral study of Environmental Engineering plays an important role in strengthening the national scientific infrastructure and creating the foundations for socially responsible, environmentally sustainable and technologically based development of the Republic of Croatia.

The doctoral study of Environmental Engineering at the Faculty of Geotechnical Engineering is firmly based on scientific research that is continuously conducted within the Faculty, which ensures a strong connection between doctoral theses and the priority research areas of the institution. The thematic orientations of the doctoral dissertations clearly reflect the focus of the Faculty on interdisciplinary research in the field of environmental protection, geotechnics, waste management, groundwater quality and the application of advanced technologies in the monitoring and treatment of various pollutants that threaten the environment. Titles of doctoral theses that have been defended so far at the doctoral study: "Modification of a robust method of geotechnical design based on the principles of reliability theory", "New methodology for calculating the model of the aggregated composite index for sustainable management of mineral resources on the example of Varaždin County", "The influence of moisture change on the compressibility parameters of the methanogenic fraction of bio-dried waste", "Dynamics of organic antibiotic pollution in karst coastal aquifers under the influence of seawater intrusion", "The study of solar photocatalytic process in optimal reactor configurations based on benzotriazole degradation", "Influence of sample shape, size and degradation on the permeability coefficient of biodried waste", "Biomonitoring of metals in the environment and bee colonies", or "Organic pollutants of increasing importance in karst groundwater in Croatia", "Photocatalytic decomposition of methane as a technology for reducing emissions from municipal waste landfills", testify to scientific efforts that respond not only to current environmental challenges, but also to the specific needs of the Croatian area.

The scientific contributions of doctoral candidates are the result of collaboration within the framework of national and international scientific projects actively implemented by the Faculty. In this way, the doctoral program is integrated into a broader research context and contributes to the overall scientific visibility of the institution. Consequently, doctoral dissertations are not isolated academic works, but

rather the concrete outcome of strategically oriented research developed by the Faculty through its scientific, research, infrastructural, and project capacities.

The doctoral study follows the latest scientific knowledge and contemporary achievements, which is also evident from the published scientific papers in international journals and in the proceedings of international conferences, which directly resulted from doctoral theses and cooperation between doctoral students and their mentors in the doctoral study: paper 1, paper 2, paper 3, paper 4, paper 5, paper 6, paper 7, paper 8, paper 9, paper 10, paper 11, paper 12, etc.

The Faculty of Geotechnical Engineering has so far organized four scientific doctoral conferences entitled "Research in Environmental Engineering", which clearly strengthens the position of doctoral studies and doctoral students at the local, national and international level:

The first doctoral conference was held in June 2021 in a virtual format, bringing together 24 doctoral students from different institutions on topics in the field of sustainable waste management, valorisation of natural resources and climate change

The second doctoral conference followed in 2022, with a focus on photocatalysis and recycled materials, within the framework of EU-co-funded projects (e.g. RECYCLED RUBBER & SOLAR PHOTOCATALYSIS)

The third doctoral conference was held on September 29, 2023, organized in a hybrid format in cooperation with the UNESCO Groundwater Youth Network (GWYN), with international participation and presentations in English

The fourth doctoral conference was held in May 2025, including online participation and sessions on topics such as water conservation, climate change, and circular economy.

The key benefits and contributions of doctoral conferences are to provide doctoral students with the opportunity to present their research to an international audience, with the encouragement of interdisciplinary dialogue, to confirm the active role of the GFV in international research networks (e.g. GWYN, UNESCO), strengthening the synergy between theoretical and practical knowledge acquired during the study and increasing the visibility of the faculty in the global academic community. These conferences represent a concrete instrument by which the faculty integrates doctoral students into the institutional scientific mission, improves research culture and achieves strategic goals related to interdisciplinarity, internationalization and sustainable development.

Also, the GFV's Development Strategy for the period 2023-2027. stresses the need for "research that has an impact on achieving excellence in new priority areas of science" and stresses capacity building in the areas of green technologies and international mobility.

Furthermore, through the projects Internship in the Economy from the National Recovery and Resilience Plan 2021-2026. Our teachers were mentors to doctoral students from the economy. The project is designed for the training of people who want to attend doctoral studies and obtain a doctorate in addition to employment in a company. The project enabled the establishment of cooperation between the research organization – the Faculty of Geotechnical Engineering, companies and young researchers on a project of common interest. A company that has employed or intends to employ a person in the company, who will enrol in a doctorate at the Faculty of Geotechnical Engineering. The project team is composed of a young researcher (doctoral student), a mentor from

the Faculty of Geotechnical Engineering and the head of the applicant's research. The support allows a company to employ a PhD student full-time, for three years, and to ensure the participation of the PhD student in relevant trainings to strengthen skills for smart specialization, industrial transition and entrepreneurship. In this way, the cooperation between the Faculty of Geotechnical Engineering and the economy is further strengthened.

The doctoral study follows the regulations of the University of Zagreb, which requires new scientific contributions through papers published in journals with Web of Science/Scopus criteria, while ensuring academic excellence and quality in accordance with international standards. In addition, doctoral thesis committees are in most cases interdisciplinary with the involvement of international scientists.

The doctoral study of Environmental Engineering is fully aligned with modern scientific and professional achievements in the field of environmental engineering. The curriculum of the study is shaped according to current challenges and strategic guidelines. The implementation of studies is monitored by the Higher Education and Scientific Activity Act, the Ordinance on Doctoral Studies of the University of Zagreb, the Ordinance on Postgraduate Studies at the Faculty of Geotechnical Engineering and related amendments. The content of the study includes the latest concepts in the field of geotechnical engineering, advanced methods of water and waste treatment, photocatalysis, biomonitoring and circular economy, which ensures scientific relevance and multidisciplinary. The curriculum includes courses and research topics that are in line with the latest publications, practices and technological developments, which is also confirmed through the connection with active scientific research projects of the Faculty, including international and EU projects. Almost all faculty teachers are involved in teaching at the doctoral study. Tables 1b and 4.3 of the analytical appendices show only teachers in doctoral studies who teach in the academic year of evaluation. In the entire considered evaluation period, starting from 2019/2020, the following employees of the Faculty of Geotechnical Engineering also taught at the doctoral study: Prof. Emeritus Mladen Božičević i Prof. Emeritus Božidar Biondić, Assist. Prof. Mario Gazdek, PhD, Prof. Miroslav Golub, PhD, Prof. Krešo Ivandić, PhD, Assoc. Prof. Boris Kavur, PhD, Prof. Igor Petrović, PhD, Prof. Nikola Sakač, PhD, Prof. Zvjezdana Stančić, PhD and Prof. Stjepan Strelec, PhD.

In addition, through compulsory forms of work that are not the teaching process (research seminars, participation in discussion groups, publication of professional and scientific papers, participation in conferences, summer schools...) through which the necessary ECTS credits are acquired, the study encourages the application of the latest methodologies of scientific work, including the use of digital technologies, modelling of environmental processes and tools for risk and reliability analysis, which further harmonizes it with the standards of the profession and expectations of the knowledge market.

Although GFV currently only has a study of Environmental Engineering, the faculty encourages interdisciplinarity and innovation through strategic sections such as GFVID, STEM Centre and Makerspace, which creates conditions for the development of new study programs (undergraduate, graduate and doctoral) and thematic areas in cooperation with the public and private sectors with the acceptance and development of the latest digital tools.

5.5 The higher education institution applies the principles of open science in its activities, processes and acts

The higher education institution has adopted an open science policy that encourages the application of the principles of open science to institutional level and ensuring open access to evaluation papers (final and graduate doctoral dissertations), scientific and professional publications, educational content and research data of its staff and students.
A higher education institution has its own institutional repository in which it enables its employees and students to storing and ensuring open access to their evaluation papers, scientific and professional publications, educational content and research data.
The higher education institution encourages and evaluates the application of the principles of open science through various internal processes and/or evaluation processes at the institution.
If the higher education institution has an organised publishing activity, publications (books, journals and other types) published are available in open access.

In the observed period, the Faculty of Geotechnical Engineering did not formally adopt an open science policy, however, relations through informal policy encourages the application of the principles of open science at the institutional level and through the DABAR repository provides open access to evaluation papers (final and graduate theses and doctoral dissertations).
The Faculty has developed a DABAR digital repository located within the SRCE Student Computer Centre and which enables storage and open access to evaluation papers, scientific and professional publications, educational content and research data of its employees and students. This repository plays a key role in supporting the principles of open science as it provides free access to the relevant academic papers and research selected so far, thus contributing to the dissemination of knowledge and increasing the visibility of the Faculty in the academic and scientific environment. Also, depending on the requirements and conditions of scientific and professional projects, research data sets can be stored in an institutional repository.

The Digital Repository of the Faculty of Geotechnical Engineering gathers and permanently stores the results of scientific research, intellectual and creative work of a certain institution (institutional) or papers on the same scientific topic (thematic). In this way, the digital repository increases the visibility and citation of the papers themselves, contributes to the transparency of the work of the institution that launched the repository, and encourages and accelerates the sharing of information in the scientific and academic community. By storing them in a digital repository, the papers are permanently protected from loss. There are 5 types of object access in the DABAR repository, which are defined when storing an object:

- Open access work - the complete work and information about it are available to everyone.
- Work available after (Embargo) - work data is available to everyone from the moment the work is stored, but the complete work is not available until the date specified when storing.
- The paper is available to all users from the science and higher education system of the Republic of Croatia (Limited access) - data on the paper is available to everyone, but the complete paper is available only to authorized persons who have logged in to the repository with AAI@EduHr electronic identity.

- The work is available only to employees and students of the home institution (Institutional access) - data on the work is available to everyone, and the complete work is available to authorized persons who are employees or students of the home institution.
- Paper not available (Closed access) – data on work is available to everyone, complete work is unavailable.

The Analytical Annex (Table 5.5) contains the number of all defended evaluation papers at the Faculty of Geotechnical Engineering in the observed period. Out of a total of 288 defended theses stored in the DABAR institutional repository, 46% of final theses, 51% of graduate theses and 57% of doctoral theses are in open access. When defending their final or graduate thesis, students must sign a Statement by which the author of the paper gives approval for the work, free of charge, to be permanently published to the public and made available free of charge (circle the selected option): a) to the general public; b) students and employees of the institution; c) to the general public, but after the lapse of 6 / 12 / 24 months; d) all users from the science and higher education system of the Republic of Croatia; e) the work is not available (a request with an explanation is submitted to the Teaching Committee).

When defending the doctoral thesis, the student signs the Statement on the storage, public disclosure and use of the doctoral thesis so that the doctoral thesis is permanently stored in the publicly available digital repository of the Faculty of Geotechnical Engineering, University of Zagreb DABAR and the repository of the National and University Library in Zagreb as (circle the selected option): a) doctoral thesis in open access; b) doctoral thesis in open access after the date (date); c) doctoral thesis available only to students and employees of the home institution (GFV); d) none of the above (closed access). Also, the option is chosen, regardless of whether the work is in open access, the GFV Central Library sends an electronic version of the said doctoral dissertation for private use, intended for teaching or scientific research, upon request, with the obligation to cite the source.

Through the DABAR repository, it is possible to manage research data derived from the scientific research and professional activities of the employees of the Faculty of Geotechnical Engineering. The number of research data stored in the DABAR institutional repository for the Faculty of Geotechnical Engineering is 3, all of which are available in open access.

Of the total number of published scientific papers at the Faculty of Geotechnical Engineering, 65% of papers were published in open access.

Since 2014, we have been publishing the journal "Environmental Engineering". The journal is published exclusively in open access in English in digital format. In addition to journals, the Faculty of Geotechnical Engineering conducts its own publishing activity, which includes the publication of books and proceedings. All editions of the Faculty are stored in its library, where they are available to students and employees. The library has a certain number of copies of books authored by the teachers of the Faculty, and users can borrow them – students for a period of one month with the possibility of extension, while employees can keep books without a time limit. Since the library is not open to the public, the presentation of library materials, including the publications of the Faculty, is not allowed to persons who are not members of the academic community of the Faculty. However, such users are provided with an insight into the materials within the library space. All printed editions of the Faculty are submitted to the National and University Library in Zagreb, which then forwards them to other

relevant university and research libraries in accordance with the Libraries and Library Activities Act (OG 17/19; 98/19; 114/22; 36/24) and the Ordinance on Legal Deposit (OG 66/20).