LEARNING OUTCOMES STATEMENT
CIVIL ENGINEERING
FIRST-CYCLE PROGRAMME — GENERAL ACADEMIC PROFILE

Area of academic study

Civil engineering is the field of study within the Technological Sciences area (discipline: Technology, field of of study: *Civil Engineering*)

Learning outcomes have been mapped to:

K (before an underscore)	– learning outcomes at the programme level
W	– knowledge
U	– skills
K (after an underscore)	– social competence
T1A	– learning outcomes at the Technological Sciences area level - first-cycle programme
01, 02, 03 ...	– learning outcome consecutive number

Table of reference: field to area learning outcomes

Symbol	Learning outcomes for civil engineering. On successful completion of the first-cycle programme in construction, the graduate will	Reference to learning outcomes
	KNOWLEDGE	
K_W01	have a knowledge of mathematics and physics suitable for understanding and describing fundamental physical phenomena and processes in civil engineering	T1A_W01
K_W02	have a knowledge of selected subfields of chemistry suitable for understanding basic chemical processes applicable to civil engineering	T1A_W01
K_W03	identify basic geological processes, factors that cause them and the effects of those processes; know the basics of civil engineering documentation and the assessment criteria for geological environment as construction ground	T1A_W02 T1A_W07
K_W04	be able to define map projections and knows basic geodetic survey works for construction	T1A_W02 T1A_W07
K_W05	know the rules of descriptive geometry and drafting conventions concerning the language of architectural, construction, survey and traffic infrastructure drawings and the rules of producing them from CAD software	T1A_W01 T1A_W03 T1A_W07
K_W06	have a knowledge of general mechanics, strength of materials, materials modelling and the principles of general shaping and optimisation of structures	T1A_W01 T1A_W03 T1A_W07
K_W07	know the fundamentals of mechanics and analysis of bar structures in terms of stress, stability and dynamics	T1A_W03 T1A_W04 T1A_W07
K_W08	know basic standards, regulations and guidelines for the design, construction and operation of building objects and their elements	T1A_W03 T1A_W07
K_W09	know the basics of dimensioning and building construction systems and elements of metal, reinforced concrete, composite, timber, masonry and road structures	T1A_W04 T1A_W07
K_W10	know the basics of the design and analysis of typical structures of general, industrial, transportation, bridge and underground construction	T1A_W04 T1A_W07
K_W11	know the rules of geotechnical assessment of the conditions for the design and construction of structures	T1A_W03 T1A_W07

K_W12	have a basic knowledge of building works technology, execution, design and operation of transportation infrastructure	T1A_W03 T1A_W05 T1A_W07
K_W13	have a knowledge of building work technology and organisation, in particular of the construction process design; have a basic knowledge of selected construction technologies	T1A_W03 T1A_W05 T1A_W08
K_W14	have a knowledge of creating procedures for construction work quality management; knows the standards and rules of construction work and the principles of site management; have a knowledge of assessment methods for economic feasibility of building projects	T1A_W03 T1A_W08 T1A_W09
K_W15	have a knowledge of the influence of building projects on the environment and the methods of the evaluation of the structure and technical infrastructure life cycle	T1A_W06 T1A_W08 T1A_W09
K_W16	have a basic knowledge of running a construction-related business and of the procedures in force in management of a building project	T1A_W08 T1A_W09 T1A_W11
K_W17	know selected computer software used to aid the computation and design of structures and planning building works organisation and management	T1A_W05 T1A_W07
K_W18	have a knowledge of modern building materials, including their classification, properties, manufacturing, use and impact of the environment and human organism	T1A_W05 T1A_W07 T1A_W08
K_W19	know the basics of building physics concerning the flow of heat and moisture, acoustics in buildings and know the rules of energy-efficient building design	T1A_W01 T1A_W03
K_W20	have a basic knowledge of civil engineering–related issued, in particular of town planning and architecture, building systems, hydraulics and hydrology, and will know the rules concerning occupational safety and hygiene	T1A_W02
K_W21	have a basic knowledge of diagnosis and durability of building structures	T1A_W06
K_W22	have a knowledge of the function of information, selection of information sources and technical ways of collecting, storing and distributing information and elements of multimedia technologies	T1A_W02 T1A_W08
K_W23	have an elementary knowledge of intellectual property protection and patent law	T1A_W02 T1A_W10
SKILLS		
K_U01	be able to use mathematical methods and apply physical and chemical processes to solving construction-related problems	T1A_U09
K_U02	be able to classify building structures, load bearing structures and structural system elements	T1A_U14
K_U03	be able to determine, classify and summarize the loads acting on building structures	T1A_U14
K_U04	based on the genesis, lithology and stratigraphy of rocks, demonstrate the ability to carry out preliminary evaluation of the site geological and engineering conditions; be able to assess the influence of geological processes on engineering work and building structures	T1A_U15
K_U05	demonstrate the ability to formulate basic geodetic tasks for construction; be able to operate basic geodetic equipment and perform simple work	T1A_U08 T1A_U14
K_U06	be able to interpret the drawings from related industries, in particular, geodetic drawings and maps	T1A_U15
K_U07	be able to draw and interpret architectural, structural, construction and geodetic drawings and to prepare graphical documentation from CAD software and manually	T1A_U15 T1A_U16

K_U08	be able to correctly define calculation models for computer analysis of structures	T1A_U07 T1A_U09 T1A_U15
K_U09	be able to perform static and strength analyses of statically determinate and indeterminate bar structures	T1A_U09 T1A_U15
K_U10	be able to analyse linear stability and limit load-bearing capacity of simple bar systems in terms of the structure critical and limit states	T1A_U09
K_U11	be able to determine natural frequency for simple bar structures and to conduct a dynamic analysis of simple bar systems in terms of resonance state evaluation	T1A_U09
K_U12	be able to choose and use methods (analytical or numerical) to aid structural design and building work planning; be able to interpret the results	T1A_U07 T1A_U09 T1A_U15
K_U13	be able to use basic standards, regulations and guidelines concerning the design, execution and operation of building structures and their elements and to comply with legal provisions	T1A_U10 T1A_U11 T1A_U15
K_U14	be able to design basic architectural objects and simple building structures and selected elements of metal, reinforced concrete, composite, timber, masonry and road structures	T1A_U14 T1A_U16
K_U15	be able to design selected elements of simple building utility systems and to determine relevant connectors	T1A_U14 T1A_U16
K_U16	have competencies for conducting laboratory tests and field tests, and for processing geotechnical documentation	T1A_U08 T1A_U09 T1A_U15
K_U17	be able to identify and evaluate the soil in terms of the conditions it provides for the construction of building structures	T1A_U13 T1A_U14
K_U18	be able to design geotechnical structures and foundations for building structures	T1A_U14 T1A_U16
K_U19	be able to compile a simple cost estimate and building works schedule; be able to analyse the costs and benefits for a non-complex building project	T1A_U10 T1A_U12 T1A_U16
K_U20	be able to design building processes in terms of technology and management; be able to programme partial processes of concrete prefabricate manufacturing in terms of technology and management, including economic optimisation elements	T1A_U09 T1A_U12 T1A_U16
K_U21	be able to organise the work stand according to the rules of technology, organisation and management in the construction industry	T1A_U12 T1A_U13 T1A_U16
K_U22	be able to assess the risks related to building works and implement relevant safety procedures	T1A_U10 T1A_U11 T1A_U13
K_U23	be able to carry out basic tests to identify or evaluate the quality of a building material	T1A_U08 T1A_U09
K_U24	be able to choose a building material suitable for a given, typical use and evaluate adequacy of typical building materials to a variety of applications; be able to design selected building materials conforming to the requirements formulated in relevant standards ad regulations	T1A_U13 T1A_U16
K_U25	be able to evaluate the condition of structural elements of a building and indicate the methods to be used in repairs or strengthening	T1A_U09 T1A_U13
K_U26	be able to make an energy balance for a building	T1A_U16
K_U27	demonstrate skills in information technologies, including operational systems; be able to select appropriate IT tools to solve problems; be able to formulate problems so that they can be solved using IT tools; be able use selected formats of computer graphics and electronic documentation	T1A_U02 T1A_U15 T1A_U16

K_U28	be able to communicate, orally and in writing, in a foreign language regarded as the instrument of international communication; be able to collect information from the literature and other sources	T1A_U01 T1A_U06
K_U29	be able to gain construction industry-related information from the literature, databases and other properly selected sources, also in a foreign language; demonstrates the skill of self-study; be able to prepare documented paper and presentation concerning construction-related issues	T1A_U01 T1A_U03 T1A_U04 T1A_U05 T1A_U06
SOCIAL COMPETENCE		
K_K01	be able to work independently and as a team member; be able to set priorities for the execution of tasks	T1A_K01 T1A_K03 T1A_K04
K_K02	understand the importance of responsibility in engineering work, including reliability of presented results and their interpretation	T1A_K02 T1A_K05 T1A_K07
K_K03	be aware of the need to upgrade professional and personal competence; independently complement and broaden knowledge; be aware of entrepreneurship values in engineering activity and thought	T1A_K01 T1A_K06
K_K04	formulate conclusions and describe his/her findings; be communicative in media presentations	T1A_K07
K_K05	be aware of the responsibility for occupational safety of hi/her own person and other people in the team; be aware of the risks that occur in the construction industry	T1A_K02 T1A_K07
K_K06	be aware of the need for taking care of his/her health and fitness	T1A_K04
K_K07	follow the rules of professional ethics	T1A_K05 T1A_K07
K_K08	Understand the importance and follow the rules of sustainable development in the construction industry; be able to see the systemic and non-technical aspects of engineering tasks;	T1A_K02 T1A_K05
K_K09	be sensitive to preserving natural resources	T1A_K02