

## ASSUMED LEARNING OUTCOMES

Specialization: Civil Engineering (CEB)

**Faculty: Civil Engineering**

**Main field of study: civil engineering**

**Education level: second-level studies**

**Profile: general academic profile**

### Location of the field of study

Branch of science: engineering and technical sciences

Discipline / discipline for several disciplines, please indicate the leading discipline)

Civil engineering and transport (major discipline)

### Explanation of the markings:

P6U – universal first degree characteristics corresponding to education at the first-level studies - 6 PRK level \*

P7U – universal first degree characteristics corresponding to education at the second-level studies - 7 PRK level \*

P6S – second degree characteristics corresponding to education at the first-level studies - 6 PRK level \*

P7S – second degree characteristics corresponding to education at the second-level studies - 7 PRK level \*

W - category "knowledge"

U - category "skills"

K - category "social competences"

K (*faculty symbol*) \_W1, K (*faculty symbol*) \_W2, K (*faculty symbol*) \_W3, ... - main-field-of study learning outcomes related to the category "knowledge"

K (*faculty symbol*) \_U1, K (*faculty symbol*) \_U2, K (*faculty symbol*) \_U3, ... - main-field-of study learning outcomes related to the category "skills"

K (*faculty symbol*) \_K1, K (*faculty symbol*) \_K2, K (*faculty symbol*) \_K3, ... - main-field-of study learning outcomes related to the category "social competences"

S (*faculty symbol*) \_W..., S (*faculty symbol*) \_W..., S (*faculty symbol*) \_W..., ... - specialization learning outcomes related to the category "knowledge"

S (*faculty symbol*) \_U..., S (*faculty symbol*) \_U..., S (*faculty symbol*) \_U..., ... - specialization learning outcomes related to the category "skills"

S (*faculty symbol*) \_K..., S (*faculty symbol*) \_K..., S (*faculty symbol*) \_K..., ... - specialization learning outcomes related to the category "social competences"

Main field of study learning outcomes	Description of learning outcomes for the main-field-of study	Reference to PRK characteristics		
		Universal first degree characteristics (U)	Second degree characteristics typical for qualifications obtained in higher education (S)	
			Characteristics for qualifications on 7 levels PRK	Characteristics for qualifications on 6 and 7 levels of PRK, enabling acquiring engineering competences
<b>KNOWLEDGE (W)</b>				
<b>K2_W01</b>	possesses essential advanced knowledge in the area of chosen sections of mathematics and physics in the scope being the basis for the strength of materials, mechanics, including dynamics as well as the theory of structures.	<b>P7U_W</b>		<b>P7S_WG_INZ</b>
<b>K2_W02</b>	possesses broadened knowledge of advanced problems related to the strength of materials and materials modelling	<b>P7U_W</b>	<b>P7S_WG,</b>	<b>P7S_WG_INZ</b>
<b>K2_W03</b>	possesses the necessary knowledge about the theoretical basis of methods for modelling, analysis and dimensioning of advanced (complex) structures	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2_W04</b>	knows advanced methods of mechanics and theory of structures	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2_W05</b>	possesses fundamental knowledge of theoretical basis of analysis and structure optimization as well as complex structural systems design	<b>P7U_W</b>		<b>P7S_WG_INZ</b>
<b>K2_W06</b>	knows standard, guidelines and regulations relevant to the building constructions design and their elements	<b>P7U_W</b>		
<b>K2_W07</b>	knows principles of analysis, construction and dimensioning of complex building construction: steel and reinforced concrete	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2_W08</b>	knows the principles of cooperation of the subgrade and complex structures	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2_W09</b>	knows classification and the range of applications of computer programs supporting the analysis and design of complex building constructions	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2_W10</b>	knows currently used, modern building materials and basic components of technologies and their production	<b>P7U_W</b>	<b>P7S_WK</b>	<b>P7S_WK_INZ</b>
<b>K2_W11</b>	knows the rules of creating procedures for the implementation of building investments; knows programs useful for planning of building investments including management of operation and maintenance	<b>P7U_W</b>	<b>P7S_WG, P7S_WK</b>	<b>P7S_WG_INZ, P7S_WK_INZ</b>
<b>K2_W12</b>	possesses grounded knowledge of running a business relevant to the construction industry; understands principles and basis of financial management of a company	<b>P7U_W</b>	<b>P7S_WK</b>	<b>P7S_WK_INZ</b>
<b>K2_W13</b>	possesses knowledge of the influence of implementation of construction projects on environment	<b>P7U_W</b>	<b>P7S_WK</b>	<b>P7S_WK_INZ</b>
<b>K2_W14</b>	knows construction law and the Occupational Health and Safety Act	<b>P7U_W</b>	<b>P7S_WK</b>	<b>P7S_WK_INZ</b>
<b>K2_W15</b>	knows patent law as well as intellectual property protection regulations and also code of ethics	<b>P7U_W</b>	<b>P7S_WG, P7S_WK</b>	<b>P7S_WG_INZ, P7S_WK_INZ</b>
	achieves outcomes in the category of KNOWLEDGE in one of the following specializations: <ul style="list-style-type: none"> <li>run in English language</li> </ul>			

- Civil Engineering (K2S_CEB_W) (appendix IX)				
<b>SKILLS (U)</b>				
<b>K2_U01</b>	is able to use advanced specialist tools to search databases and other sources related to discipline of civil engineering and transport; is able to use information technologies for communication and knows how to choose software that supports the work of a designer and a person who organizes and manages building processes as well as operation and maintenance of building objects	<b>P7U_U</b>	<b>P7S_UW, P7S_UU</b>	<b>P7S_UW_INZ</b>
<b>K2_U02</b>	possesses language skills in fields of study related to the studied discipline according to CEFR requirements for at least B2+ level; possesses ability to communicate in foreign languages and knows elements of technical language in the area of civil engineering	<b>P7U_U</b>	<b>P7S_UK</b>	
<b>K2_U03</b>	is able to establish directions of further education and follow the process of self-learning	<b>P7U_U</b>	<b>P7S_UK</b>	
<b>K2_U04</b>	is able to make a classification of simple and complex building structures	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U05</b>	is able to make assessment and any kind of loads combinations acting on building objects together with their adequate combinations	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U06</b>	is able to use advanced methods of mechanics and the theory of structures	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U07</b>	is able to use the methods of modelling, analysis and dimensioning of advanced (complex) structures	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U08</b>	is able to solve complex concepts in the area of chosen sections of mathematics, being the basis of advanced construction analysis methods; is able to choose tools (analytical or numerical) to solve engineering problems; is able to use chosen computer programs supporting modelling and design processes in civil engineering	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U09</b>	is able to critically assess the results of numerical analysis of complex engineering structures	<b>P7U_U</b>		<b>P7S_UW_INZ</b>
<b>K2_U10</b>	is able to design complex foundations of building objects	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U11</b>	is able to model and design complex elements and structures	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U12</b>	is able to prepare a graphics project documentation in the environment of chosen graphics programs	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2_U13</b>	is able to prepare the schedule of construction works and cost estimate of a construction undertaking and assess the efficiency of construction projects	<b>P7U_U</b>	<b>P7S_UO</b>	
<b>K2_U14</b>	is able to assess threats related to construction projects implementation and implement adequate safety principles, is able to develop norms and standards of work and quality management procedures	<b>P7U_U</b>	<b>P7S_UW, P7S_UK, P7S_UO, P7S_UU</b>	<b>P7S_UW_INZ</b>
<b>K2_U15</b>	is able to plan and carry our laboratory experiments leading to quality assessment of applied materials and also the assessment of the strength of building structure elements	<b>P7U_U</b>		
<b>K2_U16</b>	is able to, according to scientific principles, using scientific know-how to formulate and develop entry works of a research type leading to solving engineering problems as well as technological and organizational, in civil	<b>P7U_U</b>	<b>P7S_UW, P7S_UU</b>	<b>P7S_UW_INZ</b>

	engineering			
<b>K2_U17</b>	is able to plan, prepare and carry out research and prepare elaborations which prepare him/her to take up research work	<b>P7U_U</b>	<b>P7S_UW, P7S_UU</b>	<b>P7S_UW_INZ</b>
	achieves outcomes in the category of <b>SKILLS</b> in one of the following specializations: <ul style="list-style-type: none"> <li>run in English language</li> </ul> - Civil Engineering ( <b>K2S_CEB_W</b> ) (appendix IX)			
<b>COMPETENCES (K)</b>				
<b>K2_K01</b>	is aware of the need to continually improve professional and personal competences; in the form of formal or informal education, it complements and expands knowledge in the field of modern processes and technologies related to civil engineering and transport	<b>P7U_K</b>	<b>P7S_KK</b>	
<b>K2_K02</b>	realizes the significance and understands non-technical aspects and consequences of engineering activity and especially its influence on the natural environment and the related responsibility for decisions	<b>P7U_K</b>	<b>P7S_KK</b>	
<b>K2_K03</b>	is able to work independently and cooperate in a group on given tasks is responsible for safety of his own work as well as his team	<b>P7U_K</b>	<b>P7S_KK, P7S_KO</b>	
<b>K2_K04</b>	Realizes the significance of professional behaviour and obey the code of ethics; identifies correctly and solve dilemmas related to the profession; is able to set priorities which help in implementing a task set by himself or others	<b>P7U_K</b>	<b>P7S_KO, P7S_KR</b>	
<b>K2_K05</b>	is able to think and act in a creative and entrepreneurial way	<b>P7U_K</b>	<b>P7S_KO</b>	
<b>K2_K06</b>	realizes the social role of technical university graduates and especially understands the need to formulate information and share it with society, e.g. through mass media, in relation to achievements in environmental engineering and other aspects of engineering activity; makes attempts at sharing such information and opinions in an understandable way, justifying different points of view.	<b>P7U_K</b>	<b>P7S_KK, P7S_KO, P7S_KR</b>	
<b>K2_K07</b>	is aware of the necessity of individual and team activities going far beyond an engineering activity	<b>P7U_K</b>	<b>P7S_KK, P7S_KO, P7S_KR</b>	

## Attachment I

**Specialization: Civil Engineering (CEB)**

Specialization learning outcomes	Description of learning outcomes for the specialization	Reference to PRK characteristics		
		Universal first degree characteristics (U)	Second degree characteristics typical for qualifications obtained in higher education (S)	
			Characteristics for qualifications on 7 levels PRK	Characteristics for qualifications on 7 levels PRK
<b>KNOWLEDGE (W)</b>				
<b>K2S_CEB_W16</b>	possesses deepened and broadened knowledge of analysis, dimensioning and construction of complex structures in general construction: metal and reinforced concrete (objects)	<b>P7U_W</b>	<b>P7S_WG</b>	
<b>K2S_CEB_W17</b>	possesses additional knowledge in the area of hydraulics	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2S_CEB_W18</b>	possesses broadened knowledge of residential municipal structures	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2S_CEB_W19</b>	possesses broadened knowledge of building roads, bridges and railways	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ</b>
<b>K2S_CEB_W20</b>	possesses developed knowledge of structures related to urban infrastructure	<b>P7U_W</b>	<b>P7S_WK</b>	<b>P7S_WG_INZ</b>
<b>K2S_CEB_W21</b>	possesses broadened knowledge of technologies of construction works	<b>P7U_W</b>	<b>P7S_WG, P7S_WK</b>	<b>P7S_WK_INZ</b>
<b>K2S_CEB_W22</b>	possesses broadened knowledge of chosen elements of structures and building objects ( subjects from elective modules)	<b>P7U_W</b>	<b>P7S_WG</b>	<b>P7S_WG_INZ, P7S_WK_INZ</b>
<b>SKILLS (U)</b>				
<b>K2S_CEB_U18</b>	possesses ability to analyse, dimension and construct complex building structures in general construction: steel and reinforced concrete (objects)	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2S_CEB_U19</b>	is able to apply advanced computational techniques, including optimization ones, to model and calculate complex building structures	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2S_CEB_U20</b>	is able to design chosen elements of geotechnical structures taking into consideration hydraulics problems	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>

<b>K2S_CEB_U21</b>	is able to design and carry out research of components and materials used in general construction	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2S_CEB_U22</b>	is able to design chosen components of objects in the field of road building, bridges and railways as well as urban infrastructure in relation to problems of general construction	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>
<b>K2S_CEB_U23</b>	is able to formulate and possesses ability to solve tasks related to chosen theoretical issues as well as to design components, structures and objects in civil engineering ( <i>subjects from elective modules</i> )	<b>P7U_U</b>	<b>P7S_UW</b>	<b>P7S_UW_INZ</b>