

Learning outcomes for the field of study BUILDING ENGINEERING 1st cycle (BSc degree),
general academic education profile

Explanation of symbols:

- K - learning outcomes as per of field of study
- W - knowledge category
- U - category of skills
- KB - learning outcomes for the field of Building Engineering
- (O) - (general) characteristics of 1st cycle (BSc degree) in the Polska Rama Kwalifikacji (PRK) – level 6
- (I) - characteristics of 1st cycle (BSc degree) in the PRK for qualifications comprising engineering competence – level 6

DESCRIPTION OF THE FIELD-SPECIFIC LEARNING OUTCOMES		
Efekt uczenia się dla kierunku Budownictwo	Having completed the 1 st cycle (BSc degree) studies in the field of BUILDING ENGINEERING, the graduates	Charakterystyki drugiego stopnia efektów uczenia się dla kwalifikacji na poziomie 6
KNOWLEDGE		
KB_W01	have the basics of general knowledge in mathematics, physics, chemistry, biology and other fields of science, forming theoretical principles appropriate to formulate and solve tasks related to building engineering.	P6S_WG (O)
KB_W02	have advanced knowledge of the principles of descriptive geometry and technical drawing, recording and reading architectural drawings, construction maps and geodetic maps, as well as the methods of preparing the maps both traditionally and using the Building Information Modelling (BIM) technology.	P6S_WG (I)
KB_W03	are able to define map projections and identify basic land surveying in building engineering.	P6S_WG (I)
KB_W04	have detailed knowledge of theoretical mechanics, knowledge of materials' strength and general rules of structure design; know the theories explaining complex relations of structures.	P6S_WG (O/I)
KB_W05	have advanced knowledge of construction theory and analysis of bar systems in the field of statics, dynamics, and stability.	P6S_WG (I)
KB_W06	know building legislation, Polish standards (PN) and European standards (EN), technical conditions of constructing building facilities, as well as basic ideas and rules in the field of intellectual and industrial property protection.	P6S_WG (O) P6S_WK (O)

KB_W07	knows detailed rules of constructing and dimensioning elements and metal connections; concrete, wooden, and brick building facilities.	P6S_WG (I)
KB_W08	know the basics of geology, have detailed knowledge in the field of soil mechanics and foundation engineering work.	P6S_WG (I)
KB_W09	know the rules of constructing and analysing civil engineering, low-energy, passive, sustainable, industrial, road, bridge, and railroad transport units.	P6S_WG (I)
KB_W10	have the basics of general knowledge in the field of designing general infrastructure as well as road and railroad transport.	P6S_WG (I)
KB_W11	have basic knowledge of the operation of algorithms used in selected software (including applications of BIM technology) supporting calculations, design of building structures, organisation of construction works, and costs calculation.	P6S_WG (O/I)
KB_W12	know the basics of building physics related to heat and moisture flows in building components and facilities, energy supply and the main rules of selecting installation systems.	P6S_WG (I)
KB_W13	have advanced knowledge of building materials and their properties, research methods, basic elements of design as well as performance and assembly technologies (including environment-friendly materials).	P6S_WG (O/I)
KB_W14	have detailed knowledge of the technologies of building engineering and rules of selecting tools, machines, and equipment to perform construction works.	P6S_WG (I)
KB_W15	know basic processes of building units life cycle and methods for the evaluation of their technical condition and maintenance.	P6S_WG (I)
KB_W16	have the basics of general knowledge in the field of the organisation and rules of managing the construction site, the development of building works quality management procedures; know the working standards in building engineering.	P6S_WK (I)
KB_W17	have the basics of general knowledge in the field of developing various forms of entrepreneurship in building engineering.	P6S_WK (O/I)
KB_W18	have basic knowledge of the effect of building investment projects on the environment; understand the need to implement the principles of sustainable development.	P6S_WG (O) P6S_WK (O)
KB_W19	have basic knowledge of land planning and energy planning, relations between architecture and urban planning, technical and economic potential of building engineering.	P6S_WG (O) P6S_WK (O)

SKILLS

KB_U01	are able to gather information from literature, databases and other properly selected information sources; can synthesize the obtained information, interpret and evaluate it, as well as draw conclusions, formulate, discuss and justify opinions and positions.	P6S_UW (O/I) P6S_UK (O)
KB_U02	are able to use advanced information and communication technologies (ICT) appropriate to perform typical engineering tasks.	P6S_UW (O/I) P6S_UK (O)
KB_U03	when formulating and solving problems related to building engineering, they can notice their systemic and non-technical aspects, including ethical aspects.	P6S_UW (I) P6S_UK (O)
KB_U04	are able to utilize geodetic equipment, both traditional optical and electronic instruments, carry out surveying during the assembly of building structures, which do not require professional education in the field of geodesy.	P6S_UW (I) P6S_UK (O)
KB_U05	can classify buildings building structures.	P6S_UW (O/I) P6S_UK (O)
KB_U06	can prepare statements of strengths influencing the building units and perform static analysis of statically determinate and non-determinate bar structures; can determinate natural frequency for simple bar structures.	P6S_UW (I) P6S_UK (O)
KB_U07	are able to correctly utilise numerical, analytical, simulation and experimental methods, in order to identify and solve problems in the field of building engineering; to obtain and verify the results.	P6S_UW (I) P6S_UK (O)
KB_U08	are able to design and carry out simple lab experiments dedicated to evaluate the building material and engineering structure quality; are able to clearly present and interpret the results and draw conclusions.	P6S_UW (I) P6S_UO (O) P6S_UK (O)
KB_U09	are able to use modern software supporting the design decisions in building engineering, including programs based on the BIM technology; are able to critically estimate the results of numerical analysis of building facilities.	P6S_UW (O/I) P6S_UK (O)
KB_U10	are able to design selected elements and simple metal, concrete, wooden and brick constructions, working individually or as part of a team.	P6S_UW (I) P6S_UK (O) P6S_UO (O)
KB_U11	are able to dimension basic structural elements in the units of civil, industrial, road, bridge and railroad building, working individually or as part of a team.	P6S_UW (I) P6S_UK (O) P6S_UO (O)
KB_U12	are able to perform the analysis of linear stability and ultimate limit capacity of simple bar structures, in the aspect of evaluating critical and ultimate limit states of constructions	P6S_UW (I) P6S_UK (O)

	and dynamic analysis of simple bar structures in the aspect of evaluating resonance states.	
KB_U13	are able to perform energy balance when creating the inside comfort of building units.	P6S_UW (I) P6S_UK (O)
KB_U14	are able to read and interpret architectural, building, installation and geodetic drawings, prepare graphic documentation in a traditional way and using selected CAD software (including the BIM technology).	P6S_UW (I) P6S_UK (O)
KB_U15	are able to perform preliminary economic analysis of basic engineering activities; can prepare a simple cost calculation and a work schedule.	P6S_UW (I) P6S_UK (O)
KB_U16	are able to estimate the hazards related to construction and installation works, implement appropriate safety rules (including elements of Safety and Health Protection (in Polish: Bezpieczeństwo i Ochrona Zdrowia – BIOZ)).	P6S_UW (I) P6S_UK (O)
KB_U17	can evaluate the technical condition of building facilities and indicate appropriate methods for their maintenance.	P6S_UW (I)
KB_U18	can communicate in a foreign language at B2 level according to the Common European Framework of Reference for Languages; know technical vocabulary used in the field of building engineering.	P6S_UK (O)
KB_U19	can apply the building law regulations and legal documents concerning building facilities.	P6S_UW (O) P6S_UK (O)
KB_U20	are able to analyse the architectural and urban planning needs of investor and select building and installation materials for the intended purpose.	P6S_UW (O/I) P6S_UK (I)
KB_U21	are able to organise work at the construction site, applying the rules of technology and building engineering management.	P6S_UW (I) P6S_UK (O)
KB_U22	can make plans autonomously and carry out the lifelong learning processes; can apply the obtained knowledge in the field of building engineering in order to communicate with the surroundings using specialized terminology, and discuss important problems of building industry	P6S_UU (O) P6S_UK (O)
SOCIAL COMPETENCE		
KB_K01	are able to adapt to new and changing circumstances, can define priorities for performing tasks assigned by themselves and by other people, acting in the public interest and with regard to the purposes of sustainable development.	P6S_KK (O) P6S_KO (O) P6S_KR (O)
KB_K02	take responsibility for the accuracy and reliability of work results and their interpretation.	P6S_KK (O)

KB_K03	are ready to autonomously complete and broaden knowledge in the field of modern processes and technologies of building engineering.	P6S_KR (O)
KB_K04	understand the need of team work, are responsible for the safety of their own work and team's work.	P6S_KO (O) P6S_KR (O)
KB_K05	can realise that it is necessary to improve professional and personal competence, understand the need and opportunities of continuous learning (Master and PhD studies, post-diploma studies, trainings).	P6S_KR (O)
KB_K06	are communicative in multimedia presentations.	P6S_KO (O) P6S_KR (O)
KB_K07	understand the need to transfer to the society the knowledge about building engineering, transfer the knowledge in a clear and easily comprehensible manner.	P6S_KO (O) P6S_KR (O)
KB_K08	are ready to critically evaluate the knowledge and received content, and critically evaluate the results of their own work.	P6S_KK (O)
KB_K09	understand that it is necessary to protect the intellectual property, are ready to obey the principles of professional ethics and to take care of the achievements and traditions of the engineer's profession.	P6S_KR (O)
KB_K10	can realise how important it is to take care of personal health and physical fitness.	P7S_KR (O)