

**Learning outcomes for the degree programme
BUDOWNICTWO / CIVIL ENGINEERING
second-cycle studies, general academic profile**

Smart and Resilient Buildings | Sustainable Construction and Management

Study programme for the cycle commencing in the academic year 2026/2027.

Explanation of symbols used in the codes:

- KB – learning outcomes for the Civil Engineering degree programme;
- W – knowledge;
- U – skills;
- K – social competences.
- P7S – second-stage descriptors of the Polish Qualifications Framework at level 7;
- (O) – general descriptors;
- (I) – descriptors for qualifications incorporating engineering competences.

DESCRIPTION OF PROGRAMME LEARNING OUTCOMES

Learning outcome code for Civil Engineering	Upon completion of second-cycle studies, the graduate:	Second-stage learning outcome descriptors for qualifications at level 7
KNOWLEDGE		
KB_W01	has advanced knowledge and understanding of the fundamentals of mathematics, physics, chemistry and mechanics necessary for the modelling, analysis and design of buildings and civil engineering structures	P7S_WG (O)
KB_W02	has advanced knowledge and understanding of the principles of analysis, structural design, dimensioning and configuration of elements, connections and structural systems in selected buildings and civil engineering structures	P7S_WG (I)
KB_W03	has advanced knowledge and understanding of the behaviour of materials, elements and structures, and of analytical, numerical, simulation and experimental methods used for their analysis and assessment; also has advanced specialised knowledge in selected areas of design, modelling and diagnostics of buildings and civil engineering structures	P7S_WG (O/I)
KB_W04	knows and understands the properties, testing methods, manufacturing and assembly technologies of modern construction materials and products, including low-emission, circular and prefabricated solutions	P7S_WG (O/I)
KB_W05	knows and understands the principles of using digital tools in construction and has advanced specialised knowledge of building information modelling, computer-aided design, measurements, data analysis and artificial intelligence methods	P7S_WG (O/I)

KB_W06	knows and understands the principles of sustainable, energy-efficient and universal design, and the environmental impact of construction projects throughout the life cycle of a structure	P7S_WG (O/I) P7S_WK (O)
KB_W07	knows and understands processes occurring throughout the life cycle of structures and technical systems in construction, as well as the principles of diagnostics, maintenance, repair, durability and structural safety	P7S_WG (O/I) P7S_WK (O)
KB_W08	knows and understands the principles of organising and managing construction projects, including quality, cost, time, risk and uncertainty management, and the fundamentals of business activity in the construction sector	P7S_WG (I) P7S_WK (O)
KB_W09	knows and understands the legal, economic and ethical conditions of professional activity in construction, including standards, regulations and principles of property protection, including intellectual property	P7S_WK (O/I)
KB_W10	knows and understands the main development trends in the discipline of civil engineering, geodesy and transport, and fundamental dilemmas of contemporary civilisation relevant to construction, particularly safety, climate, energy, resources, accessibility and social responsibility	P7S_WG (O) P7S_WK (O)
SKILLS		
KB_U01	can obtain information from literature, databases, technical documentation and other appropriately selected sources, integrate, interpret and analyse it, and formulate and substantiate conclusions	P7S_UW (O)
KB_U02	can apply acquired knowledge to formulate and solve complex and non-standard civil engineering problems under conditions of incomplete information or unpredictability, selecting or adapting appropriate methods and tools, including IT tools	P7S_UW (O/I)
KB_U03	can identify and formulate specifications for engineering tasks, adopt design assumptions, identify and compile relevant actions (loads) and determine technical requirements for simple and complex civil engineering structures	P7S_UW (I)
KB_U04	can perform analyses appropriate for solving technical problems using analytical, numerical or simulation methods and critically evaluate the results	P7S_UW (I)
KB_U05	can design and dimension elements, structures and civil engineering works in accordance with a specified set of requirements, and prepare technical documentation using appropriate design and digital tools	P7S_UW (I)
KB_U06	can formulate and test hypotheses related to simple research problems in civil engineering, and plan and conduct experiments, measurements and computer simulations, interpret the results, assess their reliability and draw conclusions	P7S_UW (O/I)
KB_U07	can critically analyse the operation of existing structural, material and technological solutions and assess them in terms of safety, durability, serviceability and compliance with the principles of sustainable development	P7S_UW (I)
KB_U08	can select materials, technologies and structural and construction solutions and analyse their environmental impact under complex design or operating conditions	P7S_UW (I)
KB_U09	can account for systemic and non-technical aspects, including economic, legal, ethical and organisational aspects, when solving engineering tasks, and perform a preliminary economic assessment	P7S_UW (O/I)

	of proposed actions	
KB_U10	can plan, organise or supervise selected construction processes, prepare schedules, cost estimates, quality and safety procedures, and assess risks associated with the execution or operation of a structure	P7S_UW (I)
KB_U11	can communicate on specialist topics with different audiences, conduct debates and use a foreign language at B2+ level together with specialist terminology in civil engineering	P7S_UK (O)
KB_U12	can cooperate with others in teamwork, lead a team, take a leading role in teams and organise teamwork in engineering tasks	P7S_UO (O)
KB_U13	can independently plan their own lifelong learning and guide others in this respect	P7S_UU (O)
SOCIAL COMPETENCES		
KB_K01	is prepared to critically evaluate their own knowledge and received information, recognise the importance of knowledge in solving cognitive and practical problems, and seek expert advice when unable to solve a problem independently	P7S_KK (O)
KB_K02	is prepared to fulfil professional roles responsibly, reliably document work results, observe safety rules, professional ethics and intellectual property protection, and uphold the ethos of the civil engineering profession	P7S_KR (O)
KB_K03	is prepared to fulfil social obligations, co-organise activities for the benefit of the community and initiate actions in the public interest, particularly concerning safety, accessibility and sustainable development in construction	P7S_KO (O)
KB_K04	is prepared to think and act entrepreneurially, make responsible decisions under risk, and support innovation, quality and efficiency in construction projects	P7S_KO (O)
KB_K05	is prepared to continuously develop professional and personal competences, collaborate in multidisciplinary and multicultural environments, and disseminate technical knowledge in a manner understandable to the public	P7S_KR (O) P7S_KO (O)