1.	**Field of study**	**Materials Science and Engineering**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2025/2026 (summer term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Code of the learning outcome of the programme	**Learning outcomes** The graduate:	Codes of the second-order PRK characteristics to which the learning outcome of the programme is related
KNOWLEDGE		
IM2A_W01	has in-depth and systematized knowledge covering key issues and selected aspects of advanced detailed knowledge from various disciplines constituting the theoretical foundation of materials and biomaterials engineering, including computer methods for the analysis of research techniques and phenomena and the theoretical foundations of an integrated quality management system.	2018_P7S_WG
IM2A_W02	has in-depth, structured and theoretically based knowledge of various groups of engineering materials, natural biomaterials and tissues, and analytical methods; is familiar with current and prospective areas of their application.	2018_P7S_WG
IM2A_W03	possesses in-depth, systematic, and theoretically grounded knowledge, covering the complex relationships between the structure and properties of engineering materials and biomaterials, which form the theoretical foundation necessary for shaping, manufacturing, designing, and modeling engineering materials with specific properties.	2018_P7S_WG
IM2A_W04	has in-depth, structured and theoretically based knowledge of medical diagnostic methods (ultrasound, X-ray, ECG, etc.) and techniques used to produce and shape the structure and properties of engineering materials, and knows the chemical processes and interactions of biomaterials with living organisms.	2018_P7S_WG
IM2A_W05	possesses in-depth, systematic, and theoretically grounded knowledge of material testing methods and the construction of scientific research equipment necessary for evaluating the structure and properties of materials products and technological processes.	2018_P7S_WG
IM2A_W06	knows and understands the complex processes occurring throughout the life cycle of devices, structures, and technical systems, with particular emphasis on the processes of degradation of engineering materials, preventive actions and risk assessment.	2018_P7S_WG
IM2A_W07	has in-depth, structured and theoretically based knowledge of the methodology for selecting engineering materials and biomaterials, taking into account the complex relationships between their structure, properties and operational requirements, also in the context of quality control.	2018_P7S_WG
IM2A_W08	has in-depth and structured knowledge of development trends and the latest achievements in the field of advanced engineering materials and biomaterials, as well as innovative technologies for their production and techniques for shaping their properties, with critical consideration of the principles of sustainable development and the complex challenges of modern civilization.	2018_P7S_WG, 2018_P7S_WK
IM2A_W09	possesses systematic and theoretically grounded knowledge in the field of computer-aided work and demonstrates a deep understanding of the potential applications of selected information and communication technologies, as well as software tools, in materials engineering.	2018_P7S_WG
IM2A_W10	has in-depth and systematic knowledge in the field of industrial property protection, intellectual property, copyright and patent law and research laboratory management, including standards and accreditation requirements.	2018_inż_P7S_WK
IM2A_W11	has in-depth and systematic knowledge of the principles of creating and developing various forms of entrepreneurship related to the broadly understood field of materials engineering.	2018_P7S_WK
IM2A_W12	has in-depth and structured knowledge of research methodology in materials science and non-technical areas, including research and development projects, and accreditation requirements.	2018_P7S_WG, 2018_P7S_WK
SKILLS		

IM2A_U01	is able to acquire information from various sources, including scientific literature, databases and technical standards, analysis of measurement uncertainty, make appropriate selection, evaluation and critical analysis of these sources, synthesize and creatively interpret the information, and then present the obtained results in a clear and understandable manner.	2018_P7S_UW
IM2A_U02	is able to formulate and test hypotheses related to simple research problems and analytical skills, including in particular the shaping, manufacturing, designing, modelling and selection of engineering materials and biomaterials with specific properties, also in the context of monitoring the quality of materials and products.	2018_P7S_UW
IM2A_U03	is able to apply existing or develop new methods and tools to identify, formulate and solve research problems, including statistical and computer methods, critically assessing their usefulness and effectiveness in conditions of incomplete predictability, also in the context of monitoring the quality of materials and products.	2018_P7S_UW, 2018_inż_P7S_UW
IM2A_U04	is able to select and use information and communication techniques and computer methods and tools to formulate and implement tasks, including non-technical tasks.	2018_P7S_UW, 2018_inż_P7S_UW
IM2A_U05	is able to design a simple device, material, system or implant, typical of materials engineering or biomedical engineering, in accordance with a given specification, including issues related to toxicology, using appropriate methods, techniques and design tools.	2018_P7S_UW, 2018_inż_P7S_UW
IM2A_U06	is able to, when formulating and solving tasks, perform a preliminary economic analysis and critically evaluate non-technical aspects, including in the context of global civilization challenges and project management.	2018_P7S_UW, 2018_inż_P7S_UW
IM2A_U07	is able to communicate with various audiences using appropriately tailored specialist terminology, including conducting discussions and debates, presenting and analyzing various aspects of materials engineering and in non-technical areas using appropriate specialist Polish and English terminology.	2018_P7S_UK
IM2A_U08	is able to prepare documentation regarding the implementation of tasks and reports in the context of quality control of materials and products, as well as present the results of work using appropriate methods and tools, including computer ones, using appropriate specialist terminology in Polish and English.	2018_P7S_UK
IM2A_U09	is able to work individually as well as collaborate in teams, including taking on the role of a leader directing the team's work.	2018_P7S_UO
IM2A_U10	is able to independently plan and implement the process of lifelong learning, as well as guide and support others in this area.	2018_P7S_UU
IM2A_U11	clearly and comprehensibly communicates with others in a foreign language at the B2+ level of the Common European Framework of Reference for Languages, making use of his/her knowledge and specialist terminology	2018_P7S_UK
SOCIAL COMPETENCES		
IM2A_K01	demonstrates the ability to critically evaluate the knowledge possessed and the content received, recognizes the role of knowledge in solving complex cognitive, practical and non-technical problems; is ready to seek expert advice if encountering difficulties in solving a problem independently.	2018_P7S_KK
IM2A_K02	is ready to actively engage in raising public awareness about the role and importance of materials or biomaterials engineering, promoting its achievements, and initiating actions for the public interest in this field.	2018_P7S_KO
IM2A_K03	is ready to professionally fulfill professional roles, demonstrating responsibility towards assigned duties, acting in accordance with ethical principles and professional standards, also in the context of monitoring the quality of materials and products..	2018_P7S_KR
IM2A_K04	is ready for entrepreneurial and innovative thinking and action in the field of materials engineering and biomaterials, actively seeking new solutions, including in the context of the challenges and dilemmas of modern civilization.	2018_P7S_KO