

Programme: MATERIALS ENGINEERING
Level of studies: 1st degree studies
Polish Qualifications Framework PRK level: level 6
Programme profile: general-academic profile
Field of science/arts: Engineering and technical
Discipline/Disciplines ⁱ : Materials Engineering

Learning outcomes for general university courses (foreign language classes, physical education, entrepreneurship, university mission courses) are specified in the relevant resolutions of the Senate

Symbol of the programme learning outcome	Programme learning outcomes	Reference to universal first stage descriptors – PRK levels 6-8 ⁱⁱ	Reference to second stage descriptors - PRK levels 6-8 ⁱⁱⁱ	Reference to second stage descriptors - PRK levels 6 and 7 in the field of art sciences ^{iv}	Reference to second stage descriptors - PRK levels 6 and 7 for engineering qualifications ^v
	Knowledge: Graduate knows and understands	Descriptor symbol	Descriptor symbol	Descriptor symbol	Descriptor symbol
K_W01	Presents issues in the field of exact and natural sciences, including: mathematics, physics, chemistry, biology, useful for formulating and solving simple engineering tasks	P6U_W1	P6S_WG1	x	P6S_WG1_I
K_W02	Presents knowledge of the basics of general mechanics, strength of materials, general principles and trends in the construction and dimensioning of building construction elements, about basic methods, technologies, tools and materials used in solving engineering problems in materials science and related sciences.	P6U_W1	P6S_WG1	x	P6S_WG1_I
K_W03	Presents basic knowledge about the most commonly used materials in machine constructions and building materials, as well as basic elements and trends of their production technology and metallurgical processes engineering	P6U_W1	P6S_WG1	x	P6S_WG1_I

K_W04	Presents detailed theoretical knowledge useful for planning materials design technology, including composite and functional, intended for the intended purposes	P6U_W1	x	x	P6S_WG1_I
K_W05	Presents knowledge about the properties and structure and modelling of mechanical properties of composites, methods, techniques, tools and components used in solving complex tasks in the field of manufacturing and characterization of composite materials	P6U_W1	x	x	P6S_WG1_I
K_W06	Presents knowledge of chemistry and surface physics, coating technology and methods for testing the surface structure of coatings	P6U_W1	x	x	P6S_WG1_I
K_W07	Presents knowledge on selected aspects of modern surface technologies, corrosion testing methods, corrosion phenomena and their thermodynamic aspects, theory as well as the use of magnetic materials, magnetic processes	P6U_W1	x	x	P6S_WG1_I
K_W08	Presents the basic knowledge of crystallography, crystal lattice defects and their effects on the properties of materials and methods, techniques, devices for testing crystallographic structures	P6U_W1	x	x	P6S_WG1_I
K_W09	Presents knowledge on selected aspects of modern issues of physics and chemistry in the aspect of their importance in contemporary surface engineering, adhesion theory and methods of its study, basic phenomena occurring at various phase boundaries, measurement principles by various analytical methods	P6U_W1	x	x	P6S_WG1_I
K_W10	Presents knowledge of the general methods of manufacturing individual types of materials, technology for applying various coatings as components of modern structural, intelligent and functional materials	P6U_W1	P6S_WG1 P6S_WK1	x	P6S_WG1_I
K_W11	Presents detailed knowledge of contemporary research methods and trends used in material engineering in the field of properties and construction of ceramic, metallic, polymer and composite materials	P6U_W1	P6S_WG1 P6S_WK1	x	P6S_WG1_I
K_W12	Presents basic knowledge about management standards and systems, including quality management, work safety and the environment	P6U_W1	P6S_WK1 P6S_WK2	x	P6S_WG1_I
K_W13	Presents basic knowledge about the markets regarding producers and suppliers of materials and conducting business activity	P6U_W1	P6S_WK1 P6S_WK2 P6S_WK3	x	P6S_WG1_I P6S_WK1_I
K_W14	Presents the basic knowledge of: production cycles, their economic foundations, intellectual property, copyright, legal acts and standards related to the distribution and marketing of materials, standards of use in material design.	P6U_W2	P6S_WK2	x	P6S_WG1_I,

	Skills: a graduate can	Descriptor symbol	Descriptor symbol	Descriptor symbol	Descriptor symbol
K_U01	Acquires information from literature, also in foreign language, databases, patent databases and other sources, integrates obtained information, performs their interpretation, as well as draws conclusions and formulates and justifies opinions	P6U_U1 P6U_U3	P6S_UW1, P6S_UK1, P6S_UK3	x	P6S_UW2_I
K_U02	Uses analytical methods to formulate, solve and present engineering tasks and simple research problems, identifies and formulates simple engineering tasks characteristic of material science, uses instrumental and IT methods to assess the structure and mechanical properties of materials	P6U_U1	P6S_UW1,	x	P6S_UW2_I
K_U03	Classifies and evaluates building materials, functional and intelligent, selects the optimal analytical method adapted to the content of the analyte or type of sample	P6U_U1	x	x	P6S_UW2_I
K_U04	Designs simple elements of machine parts in accordance with the given specification, implements technical drawing in one of the techniques, also using information technology	P6U_U1	x	x	P6S_UW1_I, P6S_UW4_I,
K_U05	Prepares documentation and materials on the implementation of an engineering task and prepares a text discussing the results of this task, prepares and presents a short presentation on the results of the engineering task, arguing his position	P6U_U1, P6U_U3	P6S_UK1, P6S_UK2, P6S_UK3 P6S_UW1	x	P6S_UW1_I, P6S_UW4_I,
K_U06	Works individually and in a team, develops and implements a schedule of works, studies and experiments to ensure that deadlines are met, defines priorities for his and other tasks, sets their hierarchy when preparing strategic plans and documents	P6U_K2	P6S_UO1, P6S_UO2	x	x
K_U07	Describes the properties of materials and assesses their durability and degree of wear in economic terms, and also determines their role in the economy and everyday life	P6U_U1	x	x	P6S_UW3_I
K_U08	Uses instrumental analysis methods to assess the condition and quantitative characteristics of materials, conducts chemical and physical experiments, interprets the results obtained and draw conclusions, assesses the usefulness and the possibility of using new achievements in the field of material synthesis and analysis	P6U_U1	x	x	P6S_UW2_I
K_U09	Designs the properties of manufactured materials, uses methods to assess the mechanical properties of materials and selected modern analytical methods	P6U_U1	x	x	P6S_UW1_I, P6S_UW2_I

K_U10	Uses computer techniques to process measurement data, media presentation of his own studies, uses computer-aided engineering systems in material engineering and technology, uses computer-assisted to solve technical tasks	P6U_U1	P6S_UW1	x	P6S_UW1_I
K_U11	Examines and determines the surface properties of materials using selected measurement techniques	P6U_U1	x	x	P6S_UW3_I, P6S_UW4_I,
K_U12	Describes and applies methods of recycling and material recovery recognizing global and internal trends of economies and their legal conditions	P6U_U1	x	x	P6S_UW2_I,
K_U13	Has the ability to self-study in order to expand knowledge in the field of exact and natural sciences, is able to plan its development for the future	P6U_U2	P6S_UU1	x	x

	Social competence: a graduate is ready to	Descriptor symbol	Descriptor symbol	Descriptor symbol	Descriptor symbol
K_K01	Is ready to assess his knowledge and skills, and received content	P6U_K2	P6S_KK1	x	x
K_K02	understands the non-technical aspects and effects of engineering activities, including its impact on the environment, the local community and the associated responsibility for decisions, is ready to assess the impact of its impact on the environment	P6U_K1 P6U_K2	P6S_KK2, P6S_KR1	x	x
K_K03	Is ready to take actions for the social environment, understands the need to formulate and provide the public with information and opinions on the achievements of technology and other aspects of engineering activities	P6U_K2	P6S_KO1, P6S_KO2,	x	x
K_K04	Identifies and resolves problems related to the exercise of the profession, taking into account the principles of professional ethics and consults experts in the event of difficulties in solving the problem on their own	P6U_K1, P6U_K2	P6S_KR1 P6S_KK2	x	x

ⁱ In the case of programmes assigned to more than one discipline a leading discipline has to be specified together with the percentage share of the ECTS points assigned to each discipline in the total number of the ECTS points necessary to complete the programme. A leading discipline has to account for more than 50% of ECTS points.

- ii Universal first stage descriptors for PRK levels 6-8 – Act of 22 December 2015 on the Integrated Qualifications System (Journal of Law of 2016, item 64).
- iii Second stage descriptors for PRK levels 6-8 typical for qualifications awarded by higher education institutions – Regulation of MNiSW of 14 November 2018 r. - part I.
- iv Second stage descriptors for PRK levels 6-8 typical for qualifications awarded by higher education institutions in the field of art sciences. – Regulation of MNiSW of 14 November 2018 r. - part II.
- v Second stage descriptors for PRK levels 6-8 typical for engineering qualifications awarded by higher education institutions – Regulation of MNiSW of 14 November 2018 r. - part III.