Załącznik nr 2 do Zarządzenia Nr 16/2022 Rektora PB

COURSE DESCRIPTION CARD

<table>
<tr><td colspan="10">Bialystok University of Technology
Faculty of Mechanical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6">Mechanical Engineering</td><td>Degree level and programme type</td><td>first degree</td></tr>
<tr><td>Specialisation/ diploma path</td><td colspan="6">Erasmus+</td><td>Study profile</td><td>general</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Materials Selection for Engineers</td><td>Course code</td><td></td></tr>
<tr><td>Course type</td><td></td></tr>
<tr><td rowspan="2">Forms and number of hours of educational activities</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td></td></tr>
<tr><td>30</td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>5</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Materials Science, Engineering Mechanics</td></tr>
<tr><td>Course objectives</td><td colspan="9">Familiarization with the methodology of selecting engineering materials in relation to the assumed tasks and functions of planned devices and structures. Development of skills in selecting engineering materials, taking into account analytical methods and material selection charts.</td></tr>
<tr><td>Course content</td><td colspan="9">Principles of selection of engineering materials. Sources of information on engineering materials. The role of material design in the engineering design of products and their manufacturing processes. Selection of materials vs. functional, economic, and ecological aspects.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">Informative and problem-based lecture, project</td></tr>
<tr><td>Assessment method</td><td colspan="9">Lecture: written test, with open questions
Project: Assessment of work in class - presentations of project progress; Execution and defence of the project</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td></td><td colspan="8">Knowledge: the graduate knows and understands</td><td></td></tr>
<tr><td>LO1</td><td colspan="8">advanced issues in the selection of engineering materials for specific applications, taking into account functional, economic, and ecological aspects</td><td>MB1_W01, MB1_W05</td></tr>
<tr><td>LO2</td><td colspan="8">selected issues in the field of designing construction materials</td><td>MB1_W01, MB1_W05</td></tr>
<tr><td></td><td colspan="8">Skills: the graduate is able to</td><td></td></tr>
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LO3	uses analytical methods to select materials for intended functions	MB1_U01, MB1_U05
LO4	is able to select materials from those proposed, taking into account functional, economic, and ecological aspects	MB1_U01, MB1_U07
	Social competence: the graduate is ready to	
LO5	critical assessment of one's own competences and reliable performance of the mechanical engineer's profession	MB1_K04
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
LO1	written test, assessment of work in class – presentations of the project progress, execution and defence of the project	L, P
LO2	written test	L
LO3	written test, assessment of work in class – presentations of the project progress, execution and defence of the project	L, P
LO4	is able to select materials from those proposed, taking into account functional, economic, and ecological aspects	L, P
LO5	critical assessment of one's own competences and reliable performance of the mechanical engineer's profession	P

Student workload (in hours)		No. of hours
Calculation	Participation in lectures	30
	Participation in project	30
	Preparation for the written test (lecture)	10
	Preparation of the project	10
	Execution of project tasks (including preparation of presentations)	20
	Preparation for the defence of the project	2
	Participation in consultation hours	2
	TOTAL:	104

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	62	2
Student workload – practical activities	62	2

Basic references	1. Ashby M. F., Materials selection in mechanical design, 4th ed (and newer). Amsterdam : Burlington Butterworth-Heinemann, 2011. 2. Ashby M., Shercliff H., Cebon D., Materials : Engineering, Science, Processing and Design, 4th ed. (and newer) Amsterdam : Elsevier/Butterworth Heinemann : 2019.
Supplementary	1. Ashby M. F., Materials and the Environment : Eco-informed Materials

references	**Choice, 3rd ed. (and newer) Amsterdam : Elsevier/Butterworth Heinemann : 2021.** **2. Ashby M. F., Materials and Sustainable Development. Amsterdam : Elsevier/Butterworth Heinemann : 2016 (and newer).**	
Organisational unit conducting the course	**Faculty of Mechanical Engineering**	**Date of issuing the programme**
Author of the programme	**Magdalena Lepicka, PhD Eng.**	**06.03.2025**

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar