



Subject card

Subject name and code	Designing and Selection of Materials, PG_00039925						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject				2022/2023	
Education level	first-cycle studies	Subject group				Optional subject group Subject group related to scientific research in the field of study	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	6	ECTS credits				2.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Zakład Materiałoznawstwa I Technologii Materiałowych -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Gabriel Strugała				
	Teachers		dr inż. Gabriel Strugała dr inż. Krzysztof Krzysztofowicz				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study	SUM	
	Number of study hours	30	6.0		14.0	50	
Subject objectives	Combining knowledge of basic subjects with their practical use in the process of selecting materials, taking into account the functions performed; the required characteristics of the material needed to manufacture the product. gaining the ability to critically analyze (validate) selected materials and choose the most optimal solution under strictly defined conditions.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U10] is able to formulate the principles of selecting a material for a construction, ensuring the correct operation of a device					[SU1] Assessment of task fulfilment	
	[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials					[SW3] Assessment of knowledge contained in written work and projects	
	[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle					[SW3] Assessment of knowledge contained in written work and projects	
Subject contents	<p>Lecture</p> <p>The function of material design in the processes of designing of products and their processing. Elements and phases of the engineering designing. The principles of the material selection the basic properties of the different classes of materials. The functional, sociological, ecological and economical indexes for material selection. Supporting systems and data bases. Case studies.</p> <p>Project</p> <p>Case studies regarding mechanical and thermal properties and corrosion resistance. Material selection cases with macro and microshaped. Independent solving of given design tasks.</p>						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	project		70.0%			100.0%	

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Ashby M.F., Shercliff H., Cebon D.: Inżynieria materiałowa, tom 1 i 2, wyd. Galaktyka 2011 2. Ashby M.F.: Dobór materiałów w projektowaniu inżynierskim. WNT. Warszawa 1998 3. Ashby M.F., Jones D.R.H. Materiały inżynierskie - Właściwości i zastosowania - tom 1. WNT, Warszawa 1996 4. Ashby M.F., Jones D.R.H. Materiały inżynierskie - Kształowanie struktury i właściwości materiałów - tom 2. WNT, Warszawa 1998 5. Dobrzański L.A.: Materiały inżynierskie i projektowanie materiałowe: podstawy nauki o materiałach i metaloznawstwo. WNT. Warszawa 2006 6. Blicharski M. : Wstęp do inżynierii materiałowej. Wyd. II, WNT, Warszawa 1998
	Supplementary literature	<ol style="list-style-type: none"> 1. Dobrzański L.A.: Zasady doboru materiałów inżynierskich: z kartami charakterystyk. Gliwice, Wydaw. Politechniki Śląskiej, 2000 2. Marciniak J.: Biomateriały. Wyd. Pol. Śl. 2002 3. http://www.grantadesign.com
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Analyze the functions (primary and secondary) performed by a crutch or a cane for a disabled person. Take into account age and estimated time of use. Identify the necessary characteristics of the materials. Determine material indicators. Conduct a critical analysis of potential materials. Make a choice and justify it.</p>	
Work placement	Not applicable	