



Subject card

Subject name and code	Materials, PG_00064169						
Field of study	Transport						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2026/2027	
Education level	first-cycle studies	Subject group				Obligatory subject group in the field of study	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	1	Language of instruction				Polish	
Semester of study	1	ECTS credits				2.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Division of Materials Science and Technology -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Agata Lisińska-Czekaj					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	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		3.0		17.0	50
Subject objectives	The aim of the course is to familiarize students with the basic issues of material science.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U08] able to carry out simple engineering tasks related to the construction and operation of a selected element of the transport system, select the right methods and tools		The student explains the principles of material selection in industry. Analyzes the main groups of selected materials, taking into account operating conditions.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
[K6_W02] has knowledge of physics, mechanics, electrical engineering, hydromechanics, thermodynamics, materials science, and measurement techniques necessary to understand the phenomena occurring in transportation, as well as the principles of construction and operation of infrastructure and means of transport		The student knows the methods, techniques, tools and special materials used to construct means of transport.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation			
Subject contents	Course content – lecture Genesis of materials science. Classification of materials and examples of division criteria: chemical composition, structure, application, manufacturing process. New technologies for implementation in the 21st century. Overview of the main groups of engineering materials: metals and their alloys, polymers, ceramic materials, composite materials - construction, manufacturing methods, properties, application. Solid structure. Basics of crystallography - elements of a spatial network, crystallographic systems. Chemical bonds and their characteristics. Structural defects and their types. Phase equilibrium systems. Steels, cast steel, cast iron - classification, designation, application. Basics of heat treatment. Steel heat treatment. Mechanical, electrical, optical, thermal and magnetic properties of materials. Material degradation (corrosion, cavitation, cracking). Biomimetic, intelligent and functional materials.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	written colloquium		51.0%		50.0%		
	written colloquium		51.0%		50.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Ashby M., Jones D., Materiały inżynierskie. Tom I Właściwości i zastosowanie. WNT, Warszawa 1995 2. Ashby M., Jones D., Materiały inżynierskie. Tom II Kształowanie struktury i właściwości, dobór materiałów. WNT, Warszawa 1996 3. Blicharski M., Wstęp do inżynierii materiałowej. WNT, Warszawa 2004 4. Blicharski M., Inżynieria materiałowa. Stal. WNT, W-wa 2004. 5. Dobrzański L.A., Podstawy nauki o materiałach i metaloznawstwo. WNT, Gliwice-Warszawa 2002 6. Dobrzański L.A., Metaloznawstwo z podstawami nauki o materiałach. WNT Warszawa 1996 7. Dobrzański L. A., Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie z podstawami projektowania materiałowego., WNT Warszawa, 2002 8. Ashby M., Shercliff H., Cebon D., Inżynieria materiałowa, T1, T2, Wydawnictwo Galaktyka, Łódź, 2011 9. Pampuch R., Współczesne materiały ceramiczne, Wydawnictwo AGH, Kraków 2005 10. Głowacka M., Zieliński A. (Red). Podstawy materiałoznawstwa, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2014 11. Boczkowska A., Krzesiński G., Kompozyty i techniki ich wytwarzania, Oficyna Wydawnicza Politechniki Warszawskiej, 2016 12. Królikowski W., Polimerowe kompozyty konstrukcyjne, PWN, Warszawa, 2012
	Supplementary literature	<ol style="list-style-type: none"> 1. Dobrzański L.A., Metalowe materiały inżynierskie. WNT Warszawa 2004. 2. Grabski W., Kozubowski J., Istota inżynierii materiałowej geneza, istota, perspektywy. Oficyna Wyd. Politechniki Warszawskiej, Warszawa 2003. 3. Praca zbiorowa pod red .M. Głowackiej, Metaloznawstwo. Wyd. Politechniki Gdańskiej, Gdańsk 1996. 4. Prowans S., Metaloznawstwo. PWN, W-wa 1988. 5. Przybyłowicz K., Metaloznawstwo. WNT, Warszawa 2003.
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Classification of basic groups of materials and their characteristics and examples. 2. Defects, their types and mechanisms of creation. 3. Elements of the spatial network. Crystallographic systems. 4. Explain the concept of steel, steel classification criteria (PN), steel division. 5. Materials properties. 	
Practical activities within the subject	Not applicable	

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