



Subject card

Subject name and code	Materials Science I, PG_00039858						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			e-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Artur Sitko					
	Teachers	dr inż. Artur Sitko					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 30.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=9901 Adresy na platformie eNauczanie:						
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	5.0	40.0	75		
Subject objectives	Transmission of basic knowledge regarding widely understanding materials science. Student learns about components of matter, chemical bonds, material microstructures. Student learns about chosen material properties and methods of their investigations. Student knows the important role of equilibrium diagrams on crystallization processes of alloys. Student can read their microstructures by using equilibrium diagrams. Student learns about manufacturing processes of materials, different types of heat treatments and also aspects connected with plastic working.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials				[SW2] Assessment of knowledge contained in presentation		
	[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				[SW2] Assessment of knowledge contained in presentation		
	[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		
Subject contents	General programme of subject involves: Characterization of engineering materials, Material structure, Defect structure, Structure of metallic alloys, Equilibrium diagram of Fe-Fe ₃ C, Mechanical properties of materials, Manufacturing processes of materials, Heat treatments of metallic materials, Plastic working of metallic materials, Iron alloys, Non-iron metallic alloys, Non-metallic materials, Degradation of materials.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
		50.0%			100.0%		

Recommended reading	Basic literature	W. Callister Jr., D. G. Rethwisch: Materials Science and Engineering: An Introduction, 10th Edition, 2018.M. Ashby: Materials Selection in Mechanical Design. Second edition, Department of Engineering, Cambridge University, England, 1999.
	Supplementary literature	W. Callister Jr , D. G. Rethwisch: Callister's Materials Science and Engineering, 2020
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	