



Subject card

Subject name and code	Material technologies, PG_00005006						
Field of study	Medical and Mechanical Engineering, Mechanical and Medical 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		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
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. Michał Landowski				
	Teachers		dr inż. Michał Landowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
	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	15		5.0		30.0	50
Subject objectives	Learning basic manufacturing techniques for ceramic and composite materials elements .						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W10		The student has knowledge of the techniques of producing structural elements from ceramics and composites.		[SW1] Assessment of factual knowledge		
	K6_U09		The student is able to select the production technology and material for a given structure.		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	Overview of processing methods for metallic, polymeric, ceramic and composite materials. Examples of glass processing. Stages of ceramics processing. Structural ceramic elements forming methods. Manufacturing SiC brake disc. Polymer composites processing: Processing glass and carbon fibres and BMC and SMC semi-products for composites forming. Vacuum and manual forming of polymer composites elements (hand lay-up, RTM, infusion, autoclave, RIM, SRIM, pipes and continuous elements forming). Carbon fibre car bonnet forming.						
Prerequisites and co-requisites	none						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Final test		56.0%		100.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Dobrzański L.A.: Podstawy nauki o materiałach i metaloznawstwo. WNT, Warszawa, 2002. 2. Sobczak, Kompozyty metalowe, Ed. Instytut Odlewnictwa 2002 <p>K.E. Oczoś, Kształtowanie ceramicznych materiałów technicznych, Ed.Oficyna wydawnicza Politechniki Rzeszowskiej 1996</p> <ol style="list-style-type: none"> 3. J. Ślężona, Kompozyty, Ed. Politechnika Śląska 2000
	Supplementary literature	<ol style="list-style-type: none"> 1. M. Reyne, Composite solutions, JEC Group 2006
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Cite and describe the examples of typical forming methods for glass or ceramics.</p> <p>Characterize a given processing technique for metal matrix composites reinforced with short or long fibres.</p> <p>Cite 2 groups of applications for polymer composites. What materials and manufacturing techniques are employed in these groups?</p> <p>List and characterize semi- products used in the polymer composite forming a/ thermosetting b/ thermoplastic.</p> <p>Characterize one of the following forming methods. Hand lay-up, spray-up, vacuum bagging, infusion, RTM, autoclave. Cite advantages and drawbacks of each method.</p> <p>How are laminate pipes formed?</p> <p>Characterize pultrusion forming. What is the area of its applications?</p> <p>List the examples and applications of sandwich structures.</p> <p>List processing typical of thermoplastic polymer matrix composites. What are their perspectives?</p>	
Work placement	Not applicable	