



Subject card

Subject name and code	Modern material technologies, PG_00056109						
Field of study	Mechatronics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	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 inż. Michał Landowski				
	Teachers						
Lesson types	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: 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		0.0		0.0	30
Subject objectives	The student obtains knowledge about the structure and techniques of forming composite materials.						
	The student obtains knowledge and skills related to the selection and design of composite materials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
Subject contents	Course content – lecture Lecture: Definition and division of composite materials. Factors influencing the properties of composite materials. The geometry of the reinforcement of composite materials. Characteristics (properties, manufacturing techniques) of glass, carbon, aramid, boron, silicon carbide and aluminum oxide fibers. Prediction of elastic properties and strength as a function of quantity and geometry of the reinforcement. Structure and importance of the boundary layer in polymer and metal matrix composites. Manufacturing techniques, typical properties and practical examples of applications of metal, ceramic and polymer composites. Techniques for the production of materials by powder metallurgy. Technological defects of composite materials. Composite structural materials. Gradient materials. Computer aided production and material selection.						
Prerequisites and co-requisites	Basic knowledge of materials science and strength of materials.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			50.0%		100.0%		
Recommended reading	Basic literature		<ul style="list-style-type: none">A. Boczkowska, J. Kapuściński, Z. Linderman, D. Wittemberg-Perzyk, S. Wojciechowski : Kompozyty. PW 2003.W. Królikowski, Polimerowe kompozyty konstrukcyjne, PWN 2012J. Sobczak, Kompozyty metalowe, 2002Imielińska K., Papanicolaou G.C., Wprowadzenie do nauki o materiałach kompozytowych Kompozyty polimerowe, Wybrane zagadnienia, Skrypt PG, Gdańsk 1998.F.L. Matthews, R.D. Rawlings, Composite Materials. 2008				
	Supplementary literature		<ul style="list-style-type: none">Dobrzański L.A.: Podstawy nauki o materiałach i metaloznawstwo. WNT, Warszawa, 2002.M. Reyne, Composite solutions, JEC Group 2006				

	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Choose a technology of making a carbon fiber rod.</p> <p>Give examples of applications of metal matrix composite materials in the automotive industry.</p> <p>Choose the material for the construction of the yacht's hull.</p>	
Practical activities within the subject	Not applicable	

Document generated electronically. Does not require a seal or signature.