GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056102		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
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	6	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		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Bartmański	
	Teachers		

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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	Gaining knowledge in the field of preparation, properties and characteristics of polymeric and composite materials used in medicine. Gaining knowledge about the methods of production and testing of biomaterials as well as polymer and composite bionanomaterials. Development of the ability to conduct research on the properties of polymeric and composite materials used in medicine.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W07] he/she is able to design, manufacture and utilize machine parts and technical devices, he/she can prepare a technical documentation	The student is able to independently design the components of implants, preapre a selection of materials, develop a production method and possible surface modification. Student can prepare technical documentation for individual stages.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_W13] he/she has knowledge related to application of engineering approaches in medicine or application of medical devices and rehabilitation devices	The student knows the scope of the use of polymeric and composite materials in mechanical engineering in the field of medicine.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_W04] he/she has skills in the field mechanical testing of materials used in engineering and mechanical-medical area	The student knows the methods of producing polymer and composite materials used in medicine. Student knows and is able to determine the properties of polymeric and composite materials with the use of selected methods. The student is able to independently produce polymer and composite materials used in medicine.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_K01] he/she knows his/her proficiencies and his/her limitations in performing professional tasks, he/she is aware of needing to improve his/her skills through the whole life, he/she has entrepreneurship and innovation skills, he/she is aware of engineering skills from the society point of view	The student is able to carry out literary studies in the form of publications and patents. He can correctly analyze literature sources. Can work in a group.	[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
	[K6_U07] he/she is able to identify the problem and list simple engineering tasks to solve this problem in practice, he/she is able to critically analyze the proposed technical solutions and conclude whether these solutions can be implemented to solve problems related to design of mechanical devices and mechanical-medical devices	The student is able to independently develop the basics of experiments (including process parameters), conduct it and analyze the results.	[SU4] Assessment of ability to use methods and tools
Subject contents	Characteristics of polymeric materials used in medicine.Characteristics of composite materials used in medicine.Methods of producing polymeric and composite materials in medicine.Research methods of polymeric and composite materials in medicine.Methods of surface modification of polymeric and composite materials in medicine.Design of polymeric and composite materials in medicine.		
Prerequisites and co-requisites	None.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Description of laboratory work	56.0%	40.0%
	Colloqium	56.0%	60.0%

Recommended reading	Basic literature	1. B. Świeczko-Żurek, *Biomaterials*, Wydawnictwo PG, Gdańsk 2014. 2. J. Marciniak, *Biomaterials*, Wydawnictwo Politechniki Śląskiej, Gliwice 2013. 3. A. Zielinski i inni, *Nanotechnologie w medycynie i kosmetologii,* Wydawnictwo PG, Gdańsk 2018. 4. K. Żelachowska, *Nanotechnologia, Chemia i medycyna*, Wydawnictwo PG, Gdańsk 2016.
	Supplementary literature	1. M. Ashby, Materials engineering, Wydawnictwo Galaktyka, 2011. 2. S. Błażewicz, J. Marciniak, Biomedical engineering. Basics and applications. Akademicka Oficyna Wydawnicza Exit, Warszawa 2013.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	The use of polymeric materials in medicine.Application of composite materials in medicine.Research methods for polymeric materials in medicine.Methods of testing composite materials in medicine.	
Work placement	Not applicable	

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