



Subject card

Subject name and code	Technologies for the production of biomaterials and cosmetics, PG_00024972						
Field of study	Medical and Mechanical Engineering, Mechanical and Medical Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group		Optional subject group 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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Materiałów Funkcjonalnych -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		5.0		25.0	75
Subject objectives	The aim of the course is to acquire knowledge about the technologies of producing metal, ceramic, polymer and composite biomaterials. Acquiring knowledge about acceptance test methods and properties that must be met by the produced biomaterials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U07		Student is able to draw up design assumptions aimed at the production, modification or application of the biomaterials and assess the social effects associated with its production and use.		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W04		Student has the knowledge and skills, necessary for his specialization, in the field of construction, technology and research methods of biomaterials and cosmetics.		[SW3] Assessment of knowledge contained in written work and projects		
	K6_K02		Student is aware of the responsibility, consequences and understands the importance of technology for social development and its attractiveness for industry.		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	Technologies for the production of metal biomaterials: casting, powder metallurgy, other techniques. Techniques of oxidation of metal biomaterials. Technologies for the production of ceramic materials. Technologies for applying ceramic coatings. Technologies for the production of biopolymers. Technologies for the production of composite materials. Methods of testing the acceptance properties of materials. Technologies for the production of biomedical products. Designing the manufacturing technology in terms of the conditions of use.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	laboratory		50.0%		40.0%		
	lecture		50.0%		60.0%		

Recommended reading	Basic literature	<p>1. Ossowska A., Production, structure and properties of oxide layers obtained on titanium alloys used in biomedical applications, Gdańsk University of Technology Publishing, Gdańsk 2017.</p> <p>2. Błażewicz S. Stoch L.: Biomaterials. Biocybernetics and Biomedical Engineering, vol. 4.Exit, 2000.</p> <p>3. Świczko-Żurek B.: Biomaterials, Gdańsk University of Technology Publishing, Gdańsk, 2014.</p> <p>4. Zieliński A., Serbiński W., Seramak T., Ossowska A., Świczko-Żurek B., Innovative technologies for shaping the properties of construction and biomedical materials, Gdańsk University of Technology Publishing, Gdańsk, 2018.</p> <p>5. Zieliński A. i in., Nanotechnology in medicine and cosmetology, Gdańsk University of Technology Publishing, Gdańsk, 2018.</p>
	Supplementary literature	<p>1. Dobrzański L.A.: Fundamentals of materials science and metal science. Engineering materials and the basics of material design. WNT. 2002.</p> <p>2. Marciniak J.: Laboratory exercises on biomaterials. Silesian University of Technology, Katowice.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>1. Technologies for obtaining dental implants2. Design a technology for producing a prosthetic foundation3. Describe the implantation procedure in total hip arthroplasty.</p>	
Work placement	Not applicable	