GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058720		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Technologii Biomateriałów -> 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	0.0	15.0	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	5.0	15.0	50

Subject objectives

To learn the basic knowledge of technology applications in selected fields of science and engineering: medicine and cosmetology. To gain knowledge of selected methods of manufacturing and testing of bionanomaterials and skills in this area. To develop the ability to carry out basic methods of surface modification of bionanomaterials and production of nanobiomaterials.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W07	The student can independently find and interpret information on modern methods of manufacturing and surface modification of biomaterials	[SW3] Assessment of knowledge contained in written work and projects
K7_W01	The student is able to identify trends in the manufacture of biomaterials and implants; he / she is able to draw appropriate conclusions from the knowledge of the development of implant manufacturing techniques	[SW3] Assessment of knowledge contained in written work and projects
K7_U06	The student is able to design the process of manufacturing and surface modification of implants using nanotechnology	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Nanotechnologies in technology and everyday life. Classification and techniques for obtaining nanomaterials. Mechanical methods for the study of nanomaterials. Physical methods of nanomaterials research. Chemical methods of nanomaterials research. Nanotechnologies in orthopedics. Nanotechnologies in dentistry. Nanotechnologies in cosmetology.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project	56.0%	40.0%
Colloquium	56.0%	60.0%

Recommended reading	Basic literature	1 A. Zielinski et al, Nanotechnologies in medicine and cosmetology, PG Publishing House, Gdansk 2018.2. K. Żelachowska et al, Nanotechnology in practice, PWN Scientific Publishers, Warsaw 2016.3 R.W. Kelsall, I.W. Hamley, M. Geoghegan. Nanotechnologies, Wydawnictwo Naukowe PWN, Warsaw 2011.4. K. Kurzydłowski, M. Lewandowska, Nanomaterials inżynierskie konstrukcyjne i funkcjonalne, Wydawnictwo Naukowe PWN, Warsaw 2009.5. K. Żelachowska, Nanotechnology, Chemistry and medicine, PG Publishing House, Gdansk 2016.
	Supplementary literature	1. E. Regis: Nanotechnology. The birth of a new science, or the world molecule by molecule, Prószyński i S-ka Publishing House, Warsaw 2001.2. N.P. Mahalik: Micromanufacturing and Nanotechnology, Springer Verlag 2006.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Application of nanotechnology in orthopedics. Application of nanotechnology in cosmetology. Application ofNanotechnology in dentistry. Methods of biological research of nanomaterials.	
Work placement	Not applicable	