GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biomaterials and materials of natural origin, PG_00061907		
Field of study	Materials Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Polymers Technology -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Janusz Datta	
	Teachers	prof. dr hab. inż. Janusz Datta	

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

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	2.0	8.0	25

Subject objectives

To acquaint students with the current knowledge of available types of biomaterials of practical importance and polymers of natural origin

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] Can integrate obtained information, interpret it and draw conclusions, as well as formulate and justify opinions.	Students can analyze the properties of materials and draw conclusions	[SU2] Assessment of ability to analyse information
[K6_W08] Has fundamental knowledge of the development trends in the fields of science and scientific disciplines relevant to materials engineering.	The student gained actual knowledge of materials engineering Knows the direction of development from the field of IM	[SW1] Assessment of factual knowledge

Subject contents

Biomaterials-definition and general properties. Discussion of groups of biomaterials: polymeric, carbon, composite, ceramic, and metallic. The most important areas of application of biomaterials. Quality criteria for biomaterials. Polymers of natural origin: natural rubber, cellulose, lignin, starch, proteins, proteins. Natural modified polymers: cellulose derivatives, starch derivatives. Technical vegetable oils. Application of natural polymers in industry, e.g. for water treatment. Biodegradation of natural polymers. Biopolymers - biodegradable polymers from natural monomers. Biopolyolefins

Prerequisites and co-requisites

Basic knowledge of polymers and non-polymeric materials

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written credit	50.0%	100.0%

Recommended reading

Basic literature

Rabek J. F., Biopolimery, Wydawnictwo Naukowe PWN, Warszawa, 2022

Jozef T. Haponiuk and others, Natural Polymers: Perspectives and Applications for a Green Approach, Apple Academic Press, 2021

Jan Marciniak, Biomateriały,WPS,2002

	Supplementary literature	Tondi Giianluca, Bio-Based Polymers for Engineered Green Materials. Mdpi Ag, 2021
	eResources addresses	Adresy na platformie eNauczanie: Biomateriały i polimery pochodzenia naturalnego - Moodle ID: 42526 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42526
Example issues/ example questions/ tasks being completed	Indicate what vulcanization of natural rubber consists of Discuss ceramic biomaterials Is cellulose a natural polymer suitable for the modification process?	
Work placement	Not applicable	

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