GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern engineering materials, PG_00063619		
Field of study	Materials Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	second-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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Łukasz Piszczyk	
	Teachers	dr hab. inż. Łukasz Piszczyk dr inż. Paulina Parcheta-Szwindowska	

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	5.0	15.0	50

Subject objectives

Acquisition of fundamental knowledge regarding the production and properties of contemporary polymer materials used as thermal insulation.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] Has extended and enhanced knowledge of mathematics, physics, chemistry and other fields, useful when formulating and solving problems within the scope of materials science.	The student possesses advanced knowledge in the field of materials engineering.	[SW3] Assessment of knowledge contained in written work and projects
[K7_W07] Has knowledge of the development trends and most important new achievements of the fields of science and scientific disciplines relevant to materials engineering and related disciplines.	The student has knowledge of recent advancements in materials engineering.	[SW1] Assessment of factual knowledge
[K7_U01] Can obtain information from literature, databases and other properly selected sources, also in English; can integrate the obtained information, interpret and draw conclusions, formulate and justify opinions	The student is able to correctly utilize available databases in both Polish and English	[SU2] Assessment of ability to analyse information
[K7_K01] Understands the need for lifelong learning, can inspire and organize the learning process of others. Is aware of own limitations and knows when to turn to experts, can accurately determine priorities helping to achieve the tasks specified by themselves or others.	The student understands the need for lifelong learning and is able to appropriately determine priorities to achieve tasks set by themselves or others.	[SK1] Assessment of group work skills [SK2] Assessment of progress of work [SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice

Subject contents	**Lecture:** Polymers, thermal insulation materials, plastic processing, composites, technology of manufacturing polymer-wood composites, materials for thermal insulation, phase change materials. **Laboratory:** Identification of plastics, production and processing of polyurethane materials, manufacturing of polyurethane-wood composites, investigation of fundamental physical and mechanical properties of composite materials.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	50.0%	50.0%
lecture - exam	50.0%	50.0%

Recommended reading

Basic literature	1. Blicharski M.: Wstęp do inżynierii materiałowej. WNT, Warszawa 2003. 2. Rabek J.F.: Współczesna wiedza o polimerach, PWN, Warszawa 2008 3. Królikowski W.: Polimerowe kompozyty konstrukcyjne, PWN, Warszawa 2017
Supplementary literature	1. Prociak A., Rokicki G., Ryszkowska J., Materiały poliuretanowe, Wydawnictwo Naukowe PWN, Warszawa, 2014 2. Olszewski A., Kosmela P., Piszczyk Ł., (2024). Towards sustainable catalyst-free biomass-based polyurethane-wood composites (PU-WC): From valorization and liquefaction to future generation of biocomposites, Journal of Cleaner Production, 468, 143046, https://doi.org/10.1016/j.jclepro.2024.143046 3. Xiaohang Luo, Baoyi Hao, Houkui Xiang, Hailong Li, Zechao Tao, (2023), A novel phase change materials used for direct photothermal conversion and efficient thermal storage, Solar Energy Materials and Solar Cells, https://doi.org/10.1016/j.solmat.2022.112142
eResources addresses	Adresy na platformie eNauczanie: Współczesne materiały inżynierskie - Moodle ID: 45147 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45147

Example issues/ example questions/ tasks being completed	• Characteristics of Thermal Insulation Materials • Technology of Polystyrene Processing for XPS Boards • Manufacturing Technology of Polymer-Wood Composites • Methods for Reducing the Flammability of Thermal Insulation Materials
Work placement	Not applicable

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