GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of materials engineering I, PG_00058330		
Field of study	Hydrogen Technologies and Electromobility		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sebastian Molin	
	Teachers	dr hab. inż. Sebastian Molin	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

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	60	3.0	12.0	75

Subject objectives

The aim of the lecture is to let the students familiarize with basic materials properties of classical and modern engineering materials.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] knows the properties of materials used in solving simple engineering tasks related to the field of study, in particular has knowledge in the field of materials science and is able to relate the properties of materials with their structure and composition, knows the theoretical description of phenomena occurring in materials subjected to external factors	The student knows the basic properties of materials.	[SW1] Assessment of factual knowledge
[K6_K02] can work in a group taking on different roles in it	Student solves simple technical problems; Practical knowledge of basic experimental instrumentation.	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice
[K6_U01] Is able to obtain information from literature, databases and other sources, integrate them, interpret them and draw conclusions and formulate opinions; has the ability to self-educate m.in. in order to improve professional competences	The student critically analyzes the information presented in popular science and specialist literature.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	1. History of materials 2. Materials categories 3. Bonding in materials 4. Strength of materials 5. Plastic properties of materials 6. Friction properties 7. Thermal phenomena 8. Diffusion 9. Oxidation, corrosion, materials degradation 10. Electrical properties 11. Magnetic properties 12. Optical properties 13. Engineering materials and design 14. Microscopic and macroscopic properties 15. Materials and the environment
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	70.0%
	60.0%	30.0%

Recommended reading Basic literature	Materials science and engineering: an introduction, 10th edition, Callister, Rethwisch, Wiley Inżynieria materiałowa, Blicharski, PWN, 2014
Supplementary literature	Websites with interactive educational resources: e.g. https://www.doitpoms.ac.uk/index.php
eResources addresses	Adresy na platformie eNauczanie: PODSTAWY INŻYNIERII MATERIAŁOWEJ I [2023/24] - Moodle ID: 32080 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32080
Example issues/ example questions/ tasks being completed	1. Please describe the types of atomic bonding forces. 2. Define the Young modulus and plot properties of brittle and elastic materials.
Work placement	Not applicable