



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 2024		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	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 inż. Kacper Jurak dr hab. inż. Sebastian Molin mgr inż. Justyna Ignaczak				
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_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	
	[K6_K02] can work in a group taking on different roles in it		Student solves simple technical problems; Practical knowledge of basic experimental instrumentation.			[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills	
	[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	

Subject contents	<div>1. History of materials</div> <div>2. Materials categories</div> <div>3. Bonding in materials</div> <div>4. Strength of materials</div> <div>5. Plastic properties of materials</div> <div>6. Friction properties</div> <div>7. Thermal phenomena</div> <div>8. Diffusion</div> <div>9. Oxidation, corrosion, materials degradation</div> <div>10. Electrical properties</div> <div>11. Magnetic properties</div> <div>12. Optical properties</div> <div>13. Engineering materials and design</div> <div>14. Microscopic and macroscopic properties</div> <div>15. Materials and the environment</div>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	30.0%
		50.0%	70.0%
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 [TWiE, 2024/25] - Moodle ID: 39931 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39931	
Example issues/ example questions/ tasks being completed	<div>1. Please describe the types of atomic bonding forces.</div> <div>2. Define the Young modulus and plot properties of brittle and elastic materials.</div>		
Work placement	Not applicable		

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