



Subject card

Subject name and code	Advanced engineering materials, PG_00064738						
Field of study	Power Engineering						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2025/2026		
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	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Landowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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	Acquirement of the essential knowledge in modern structural materials and maintain their at industrial work environment.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study		is able to assess the usefulness and possibility of using advanced engineering materials in energy		[SU2] Assessment of ability to analyse information		
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study		is able to identify the main development trends related to the use of modern materials in the energy industry		[SW1] Assessment of factual knowledge		
	[K7_U12] dvelops her/his own potential and independently plans own, lifelong learning, while also being able to guide others in this regard		expands his knowledge of contemporary engineering materials		[SU5] Assessment of ability to present the results of task		
Subject contents	Weldable structural steels AHSS (Advanced High Strength Steels). Modern steel grades for automotive industry. Corrosion-resistant steels: ferritic, austenitic, duplex, and precipitation hardening steels. Surface treatments of the stainless steels needed to prevent corrosion. The causes of corrosion damages of austenitic stainless steel in industrial systems. Low alloy steels operating at elevated temperature. Creep; influence of temperature, time and stresses to mechanical properties of metals. Creep-resisting steels and super alloys on the base of iron, nickel, and cobalt used in power industry, petrochemical or chemical systems. Heat-resisting steels; chemical composition, operating temperature. Refractory metals; Mo, Nb, W, Zr, Hf and their alloys. Materials on the intermetallic phase matrix. Creep-resisting light metal alloys. Wear resistant materials. Composite materials.						
Prerequisites and co-requisites	Completed courses: Material Science I and Material Science II						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			60.0%		100.0%		

