GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modern Engineering Materials, PG_00061836						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject	2023/2024			
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	English			
Semester of study	3		ECTS credits	2.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Zakład Materiałoznawstwa I Technologii Materiałowych -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Krzysztofowicz				
	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		0.0	0.0		30
Subject objectives	Obtaining the basic knowledge on the advanced construction materials and its behavior in various enviroments						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U82] is able to proficiently obtain and process information related to field of study and academic environment in foreign language at B2+ level of the Common European Framework of Reference for Languages (CEFR)	has ability to got information and prepare report	[SU2] Assessment of ability to analyse information
[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language	has ability to participate in discussion and prepare report	[SK4] Assessment of communication skills, including language correctness
[K7_K81] is able to cooperate in international team at her/his own university, during work placement and during study abroad	has required competences	[SK1] Assessment of group work skills
[K7_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice.	has required competences	[SW3] Assessment of knowledge contained in written work and projects
[K7_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice.	has required competences	[SW3] Assessment of knowledge contained in written work and projects
[K7_W81] has knowledge of complex grammatical structures and diverse lexical resources needed to communicate in foreign language in terms of general and specialist language related to field of study	has required competences	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Rules and criteria for metallic materials selection. Weldable increased and high strength steels.
Maraginig steels. Steels for automotive body sheets. Corrosion resistant and acid resistant steels: austenitic and duplex type ferritic-austenitic, corrosion resistant superalloys. Steels for elevated temperatures application.
Heat resistant and high-temperature creep resistant steels. High-temperature creep resistant iron, nickel and cobalt superalloys for power generation turbines, aviation turbines, petrochemical and chemical industry. Refractory
metals and alloys: molybdenum, niobium, rhenium, tantalum, zirconium and hafnium. Superplastic materials. MEMS and materials used in it. Materials for nuclear power generation. High entropy materials and alloys (HEM).

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
essay	50.0%	50.0%
colloquim	50.0%	50.0%

Recommended reading

Basic literature

1. Adamczyk J., Szkaradek K.: Materiały metalowe dla energetyki jądrowej. Wyd. Politechniki Śląskiej, Gliwice 1992.
2. Ashby M., Jones D.: Materiały inżynierskie. Tom I właściwości i zastosowanie. WNT, W-wa 1995.
3. Ashby M., Jones D.: Materiały inżynierskie. Tom II Kształtowanie struktury i właściwości, dobór materiałów.
WNT, W-wa 1996.
4. Baczkowska A. i in.: Kompozyty. Oficyna Wydawnicza Politechniki Warszawskiej, W-wa 2000.
5. Blicharski M.: Wstęp do inżynierii materiałowej. WNT, Warszawa 2003.
6. Blicharski M.: Inżynieria materiałowa. Stal. WNT, Warszawa 2004.
7. Chodorowski J., Ciszewski A., Radomski T.: Materiałoznawstwo lotnicze. Oficyna Wydawnicza Politechniki Warszawskiej, W-wa 1996.
8. Ciszewski B., Przetakiewicz W.: Nowoczesne materiały w technice. Wyd. Bellona, W-wa 1993.
9. Cantor B., Assender H., Grant P.: Aerospace Materials. IoP, Bristol and Philadelphia 2001

	Supplementary literature	1. Oczoś K.: Kształtowanie ceramicznych materiałów technicznych. Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów 1995. 2.Pampuch R.: Siedem wykładów o ceramice. Wyd. Akademii Górniczo-Hutniczej, Kraków 2001. 3. Śledziona J.: Podstawy technologii kompozytów. Wyd. Politechniki Śląskiej, Gliwice 1998.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Aerospace materials 2. Materials for power generation 3. MEMS	
Work placement	Not applicable	