GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Construction Materials, PG_00060637		
Field of study	Transport and Logistics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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	2	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Institute Of Naval Architecture -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Milena Supernak	
	Teachers		

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	5.0	60.0	125

Subject objectives

Presentation of knowledge in the field of metal science and materials science, taking into account selected technological aspects. To familiarize students with materials used in the construction of floating and ocean engineering facilities. Acquiring the ability to analyze structural phenomena and effects occurring in selected material groups that determine their functional properties.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] is aware of the need for continuous improvement in the field of the profession and knows the possibilities of further education	The student analyzes the relationship between the production, structure, properties and functionality of the material.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work [SK1] Assessment of group work skills
[K6_U05] can formulate a simple engineering task and its specification in the field of design, maintenance and operation of transport means and systems	The student knows the general principles of material selection in engineering design, knows the regulations regarding materials and structures and is able to use them both in design and in production supervision.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W03] has well structured knowledge of hydromechanics, thermodynamics, machine construction, ecology, material science and electrical engineering necessary to understand the principles of construction and operation of means of water transport	the student has sufficient knowledge of materials science and is able to integrate it with knowledge from other teaching subjects in order to use it in a comprehensive process of designing a structure or technological process based on sustainable development	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation

Subject contents

1. Materials and their importance in technology. Characteristics of the main groups of materials 2.. Characteristics of solids. Structure of materials. Structure defects. 3. Structure of metal alloys. 4. Phase equilibrium systems. Iron-carbon system. 5. Iron-carbon alloys. 6.Heat treatment. Thermo-chemical treatment. 7. Alloy steels. 8. Standardization and classification and marking systems for steel and cast iron. 9.Copper and copper alloys. 10.Aluminum and aluminum alloys. 11. Bearing Feet.12. Degradation of metal materials. 13. Polymer materials. 14. Composite materials. 15. Ceramic Materials. 16. Corrosion of materials. 17. Basics of material design

Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Participation in the laboratory	60.0%	50.0%
Written examination	60.0%	50.0%

Recommended reading

Basic literature

- Głowacka M., Zieliński A.: Fundamentals of Materials Science. WPG, Gdańsk 2011
- Dobrzański L.A.: Basics of materials science and metal science.. WNT, Warsaw, 2002

Supplementary literature

Dobrzański L.A.: Metal engineering materials, WNT Warszawa 2004 Dobrzański L.A.: Engineering materials and material design, WNT Warszawa 2006 M. Blicharski: Introduction to materials engineering, WNT, Warsaw 2001 Ciszewski A. et al.: Materialoznawstwo, Oficyna ed. Warsaw University of Technology, Warsaw 2006 PRS - Regulations for the classification and construction of maritime yachts

eResources addresses

Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

1. Charakterystyczne cechy metali
2. Podział metali wg kryterium ciężaru i temperatury topnienia
3. Elementy struktury materiałów
4. Rodzaje wiązań w materiałach
5. Definicja fazy oraz roztworu stałego
6. Pojęcie mieszaniny eutektycznej i eutektoidalnej.
7. Składniki fazowe i strukturalne w układzie Fe-C.
8. Przemiana eutektoidala
9. Przemiana eutektyczna
10. Stal podeutektoidalna, stal eutektoidalan, stal nadeutektoidalna
11. Martenzyt i przemiana martenzytyczna.
12. Sposoby wyżarzania z przemianą alotropową.
13. Sposoby wyżarzania bez przemiany alotropowej.
14. Sposoby hartowania.
15. Sposoby odpuszczania.
16. Od czego zależy temperatura wyżarzania, dla stali niestopowych?
17. Wykresy CTP; podaj przykład dla stali.
18. Degradacja korozyjna stali austenitycznych
19. Stan pasywny stali
20. Żarowytrzymałość i żaroodporność.

Work placement	Not applicable

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