



Subject card

Subject name and code	Construction materials, PG_00060523						
Field of study	Naval Architecture and Offshore Structures						
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			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
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	45.0	0.0	30.0	0.0	0.0	75
	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	75		8.0		67.0	150
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_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects 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 [SU5] Assessment of ability to present the results of task		
[K6_W03] has knowledge of hydromechanics, thermodynamics, machine design, ecology, materials science necessary to understand the principles of construction and operation of ocean engineering facilities and equipment		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.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects			
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		
	Written examination		60.0%		50.0%		
	Participation in the laboratory		60.0%		50.0%		

Recommended reading	Basic literature	<ul style="list-style-type: none"> 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	<p>Dobrzański L.A.: Metal engineering materials, WNT Warszawa 2004</p> <p>Dobrzański L.A.: Engineering materials and material design, WNT Warszawa 2006</p> <p>M. Blicharski: Introduction to materials engineering, WNT, Warsaw 2001</p> <p>Ciszewski A. et al.: Materialoznawstwo, Oficyna ed. Warsaw University of Technology, Warsaw 2006</p> <p>PRS - Regulations for the classification and construction of maritime yachts</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> Charakterystyczne cechy metali Podział metali wg kryterium ciężaru i temperatury topnienia Elementy struktury materiałów Rodzaje wiązań w materiałach Definicja fazy oraz roztworu stałego Pojęcie mieszaniny eutektycznej i eutekoidalnej. Składniki fazowe i strukturalne w układzie Fe-C. Przemiana eutekoidalna Przemiana eutektyczna <ol style="list-style-type: none"> Stal podeutekoidalna, stal eutekoidalna, stal nadeutekoidalna Martenzyt i przemiana martenzytyczna. Sposoby wyżarzania z przemianą alotropową. Sposoby wyżarzania bez przemiany alotropowej. Sposoby hartowania. Sposoby odpuszczania. Od czego zależy temperatura wyżarzania, dla stali niestopowych? Wykresy CTP; podaj przykład dla stali. Degradacja korozyjna stali austenitycznych Stan pasywny stali Żarowytrzymałość i żaroodporność. 	
Work placement	Not applicable	