



Subject card

Subject name and code	Metal Science, PG_00056241						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group				
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	practical profile		Assessment form		assessment		
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Milena Supernak				
	Teachers		dr inż. Paulina Strąkowska dr inż. Beata Majkowska-Marzec dr inż. Milena Supernak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		4.0		16.0	50
Subject objectives	Presentation of the field of technical knowledge which is materials science. To acquaint the student with the structure of metals and their alloys. Determination and study of the structure of metals. Examination of mechanical and physical properties of iron alloys and non-ferrous metal alloys, such as aluminum and copper.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W03		Student defines the properties of materials. The student identifies the basic properties of metallic materials. The student identifies the types of research on the crystal structure: macroscopic and microscopic. Student defines phase and structural components of Fe-C alloys.		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	K6_U05		The student analyzes the relationship between the production, structure, properties and functionality of the material.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
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.. Construction of metal alloys. 4. Phase equilibrium systems. The iron-carbon system. 5. Iron-carbon alloys. 6. Heat treatment. Thermo-chemical treatment. 7. Alloy steels. 8. Standardization, classification and marking systems for steel and cast iron. 9. Copper and copper alloys. 10.Aluminium and aluminum alloys. 11. Bearing Alloys. 12. Degradation of metal materials						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing the content of the lecture - written form	60.0%	50.0%
	Credit for the laboratory - participation, tests and reports on the completed topics	60.0%	50.0%
Recommended reading	Basic literature	<ul style="list-style-type: none">Głowacka M., Zieliński A. : Fundamentals of Materials Science. WPG, Gdańsk 2011Dobrzański L.A. : Fundamentals of materials science and metallurgy .. WNT, Warsaw, 2002.	
	Supplementary literature	Dobrzański L.A. : Metal engineering materials, WNT Warsaw 2004Dobrzański L.A. : Engineering materials and material design, WNT Warsaw 2006PRS- Rules for the Classification and Construction of Sea Yachts- 1996	
	eResources addresses	Adresy na platformie eNauczanie: METALOZNAWSTWO- PG_00056149, PG_00056276, PG_00056241 - Moodle ID: 25766 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=25766	
Example issues/ example questions/ tasks being completed	Macro and microscopic researchAnalysis of the structures of the iron-carbon systemTests of iron alloys (cast steel, cast iron, unalloyed steels)Alloy steelsStandardization and classification as well as steel and cast iron marking systems		
Work placement	Not applicable		

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