

Subject card

, PG_00056276 Ocean Engineering October 2021 first-cycle studies Full-time studies		Academic y realisation Subject gro	of subject		2021/2	2022		
first-cycle studies Full-time studies		realisation	of subject		2021/2	2022		
Full-time studies							2021/2022	
			Subject group		Obligatory subject group in the field of study			
					Subject group related to scientific research in the field of study			
1		Mode of delivery		at the university				
	1		Language of instruction		Polish no comments			
1		ECTS credits		3.0				
general academic pro	Assessmer	ssessment form			assessment			
Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology								
Subject supervisor		dr inż. Milena Supernak						
Teachers		dr inż. Paulina Strąkowska						
		dr inż. Jacek Haras						
		mgr inż. Lech Nadolny						
		dr inż. Milena Supernak						
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Lesson type					t	†	SUM	
hours	15.0	0.0	30.0			0.0	45	
E-learning hours included: 0.0								
Adresy na platformie eNauczanie:								
Metaloznawstwo , PG_00056149, PG_00056276. PG_00056241 - Moodle ID: 16738 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16738								
Learning activity					Self-study		SUM	
	classes includ	ed in study	consultation hours					
Number of study hours	45		6.0		24.0		75	
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.								
Course outcome		Subject outcome			Method of verification			
[K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine		The student analyzes the relationship between the production, structure, properties			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation			
science and electronics necessary to understand the construction and operation principles of ocean technology objects and equipment		and functionality of the material.			[SW3] Assessment of knowledge contained in written work and projects			
[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		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. Student defines iron alloys as well as aluminum			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools			
	general academic pro Institute of Ocean Eng Technology Subject supervisor Teachers Lesson type Number of study hours E-learning hours inclu Adresy na platformie Metaloznawstwo , Po https://enauczanie.pg Learning activity Number of study hours Presentation of the fiestructure of metals an mechanical and physicopper. 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Milena Supernak Lesson type Lecture Tutorial Laboratory Number of study hours E-learning hours included: 0.0 Adresy na platformie eNauczanie: Metaloznawstwo , PG_00056149, PG_00056276. PG_0005624 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16738 Learning activity Participation in didactic classes included in study plan Number of study hours Presentation of the field of technical knowledge which is materials structure of metals and their alloys. Determination and study of th mechanical and physical properties of iron alloys and non-ferrous copper. 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PG_00056241 - Moohttps://enauczanie.pg.edu.pl/moodle/course/view.php?id=16738 Learning activity Participation in didactic classes included in study plan Number of study hours Presentation of the field of technical knowledge which is materials scienc structure of metals and their alloys. Determination and study of the struct mechanical and physical properties of iron alloys and non-ferrous metal acopper. Course outcome [K6_W03] has a basic knowledge of hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation principles of ocean technology objects and equipment [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 Student defines the properties of materials. The student identifies the basic properties of materials. 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Student defines in alloys as well as aluminum	general academic profile Assesment form assessment Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Technology Subject supervisor Teachers dr inż. Milena Supernak dr inż. Jacek Haras mgr inż. Lech Nadolny dr inż. Milena Supernak Lesson type Lecture Tutorial Laboratory Project Seminar Number of study hours E-learning hours included: 0.0 Adresy na platformie eNauczanie: Metaloznawstwo , PG_00056149, PG_00056276. PG_00056241 - Moodle ID: 16738 https://enauczanie.pg. edu.pl/moodle/course/view.php?id=16738 Learning activity Participation in didactic classes included in study plan Number of study hours Persentation of the field of technical knowledge which is materials science. To acquaint the stustructure of metals and their alloys. Determination and study of the structure of metals. Examin mechanical and physical properties of iron alloys and non-ferrous metal alloys, such as alumin construction, ecology, materials science and electronics necessary to understand the construction and operation principles of ocean technology objects and equipment [K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation within the range of design, construction and operation of ocean technology objects and equipment [K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and engineering task and its specification within the range of design, construction and operation of ocean technology objects and engineering task and its specification within the range of design, construction and operation of ocean technology objects and engineering task and its specification within the range of design, construction and operation of ocean technology objects and engineering task and its specification within the range of design, construction and operation of ocean technolo	

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Subject contents Prerequisites	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						
and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Credit for the laboratory - participation, tests and reports on the completed topics	60.0%	50.0%				
	Passing the content of the lecture - written form	60.0%	50.0%				
Recommended reading	Basic literature	WPG, Gdańsk 2011Dobrzański L.A .: Fundamenta	Głowacka M., Zieliński A.: Fundamentals of Materials Science. WPG, Gdańsk 2011 Dobrzański L.A.: Fundamentals of materials science and metallurgy WNT, Warsaw, 2002.				
	Supplementary literature	 Dobrzański L.A .: Metal engineering materials, WNT Warsaw 2004 Dobrzański L.A .: Engineering materials and material design, WNT Warsaw 2006 					
	eResources addresses Metaloznawstwo , PG_00056149, PG_00056276. PG_0005624 Moodle ID: 16738 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16738						
Example issues/ example questions/ tasks being completed	Macro and microscopic research2. Analysis of the structures of the iron-carbon system3. Tests of iron alloys (cast steel, cast iron, unalloyed steels)4. Alloy steels5. Research on copper and its alloys6. Tests of aluminum and aluminum alloys						
Work placement	Not applicable						

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