GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Nonmetali Materials, PG_00043718		
Field of study	Transport and Logistics, Transport and Logistics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2020/2021
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	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Theory and Ship Design -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Lech Rowiński	
	Teachers	dr hab. inż. Lech Rowiński	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Materiały niemetalowe Transport i Logistyka - Moodle ID: 7529
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7529

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	15	2.0	8.0	25

Subject objectives

Provide knowledge with the basic knowledge regarding organic synthetic materials (plastics) that are utilized in machine and boat building as well as principles of selection of materials for structures, glues and surface coats suplemented with information regarding procurement of products.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation principles of means of marine transport	The student knows principal plastics. The student knows basic data of synthetic materials. The student is able to describe the properties of synthetic materials; He knows basic technological processes He knows basic technological processes and its influence on the usable properties of synthetic materials, he distinguishes main composites categories. He knows the basic types resins and reinforcing materials used in boat building and reinforcing materials. The student knows the principles of creating polymer composites	[SW1] Assessment of factual knowledge
[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of means and systems of transport	Student is able to select plastic material for typical technical product basing on technical specification and technological properties or indicate properties of products manufactured of considered material	[SU2] Assessment of ability to analyse information

Subject contents

Basic definitions and nomenclature (monomers and polymers); Review of non-metallic materials - natural and synthetic (cellulose, proteins, natural caoutchouc); Material characteristics for different application areas; Thermoplastics and elastomers. Mechanical and thermal properties of thermoplastics. Procurement of products using termoplastics. Duromers and their chemistry. Resins and reinforcements for marine application. Technological process of reinforced structures. Technological process of a large structural element of reinforced synthetic resin.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic chemistry. Basic mechanical properties of materials</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Short test during every lesson</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1.Dobrosz K., Matysiak A. ,Tworzywa sztuczne Warszawa WSZiP 1985

2.Kłosowska-Wołkowicz Z..Królikowski W., Penczek P..Żywice i laminaty poliestrowe. Warszawa WNT 1980

3.Kozłowski J., Wilczopolski M..Materiałoznawstwo okrętowe czIII Okrętowe Tworzywa Polimerowe. Gdynia WSMW 1982

4.Królikowski W., Tworzywa wzmocnione i włókna wzmacniające, Warszawa WNT 1988

5.Żuchowska D., Polimery konstrukcyjne. Warszawa WNT 1995</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Błędzki A.K. i inni: „Recykling materiałów polimerowych”, Wydawnictwa Naukowo Techniczne, Warszawa, 1997.

2. Composites World Journal https://gardnerweb.activehosted.com</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3"></td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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