GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Degradaton Failure of Machines and Devices, PG_00039927		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Krzysztofowicz	
	Teachers	dr inż. Krzysztof Krzysztofowicz dr inż. Jacek Haras	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

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	45	5.0	0.0	50

Subject objectives

Aimof subject is to present the students types and mechanisms of exploatation wear of machine parts and devices. Methods and techniques of wer reduction will be stressed.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	has basic knowledege	[SW3] Assessment of knowledge contained in written work and projects
[K6_U11] is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria	is able to do analysis	[SU5] Assessment of ability to present the results of task

Subject contents

Exploatation and wear of machnies and devices.Exploitation enviroment and its organization. Influence of surface layer on the wear resistance of products. Types and mechanisms of machine parts wear. Natural and failure wear. Trybological and non-triborogical wear (electrochemical corrosion,, erosion, cavitation). Synergical influence of explatation parametres on the wear process. Methods for reduction of wear of machine parts and devices (materials selection, design approach, surface and volume material proerties change).

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Essay	50.0%	50.0%
Colloqium	50.0%	50.0%

Recommended reading	Basic literature	1. Wranglen G.: Podstawy korozji i ochrony metali. WNT. Warszawa 1985. 2. Dobrzański L.A.: Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie i podstawy projektowania materiałowego. WNT. 2002. 3. Burakowski T., Wierzchoń.: Inżynieria powierzchni metali. WNT. Warszawa 1995. 4. Wyrzykowski J. W., Pleszakow E., Sieniawski J.: Odkształcanie i pękanie metali. WNT. Warszawa 1999. 5. Hernas A., Dobrzański J.: Trwałość i niszczenie elementów kotłów i turbin parowych. Gliwice 2003.
	Supplementary literature	Engineering Failure Analysis
	eResources addresses	Adresy na platformie eNauczanie: Zużycie eksploatacyjne maszyn i urządzeń , W, TMiMK, sem.06 (PG_00039927) - Moodle ID: 29659 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29659 Zużycie eksploatacyjne maszyn i urządzeń , W, TMiMK, sem.06 (PG_00039927) - Moodle ID: 29659 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29659
Example issues/ example questions/ tasks being completed	1. Wear process 2. Corrosion 3. Cavitation 4. Surface layer modofication	
Work placement	Not applicable	