



Subject card

Subject name and code	Tribology, PG_00064832						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group		Specialty 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	1		Language of instruction		Polish some additional materials in the English language		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Division of Machine Design and Medical Engineering -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Michał Wasilczuk				
	Teachers		prof. dr hab. inż. Michał Wasilczuk				
			dr hab. inż. Oleksii Nosko				
			dr inż. Grzegorz Rotta				
			mgr inż. Bartosz Bastian				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		6.0		34.0	100
Subject objectives	teaching about tribology - science of friction wear and lubrication. Showing examples dealing with advanced bearing systems						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study	The student is aware of and able to demonstrate knowledge regarding the civilizational challenges associated with the design and operation of machinery—specifically energy conservation, emission reduction, and the reduction of petroleum-based lubricant consumption.	[SW1] Assessment of factual knowledge
	[K7_U01] utilizes information obtained from the literature and other sources in the field of Mechanics and Mechanical Engineering and presents and analyses the results of solutions to technical problems in this field	The student knows and is able to apply knowledge regarding friction, wear, and lubrication.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K7_U03] plans and carries out experimental investigations to determine the parameters of devices, processes or systems in the field of Mechanical Engineering and Mechanical Engineering, appropriately selects methods, techniques and tools, interprets results and estimates measurement errors	The student is able to apply their knowledge to plan experiments in the fields of tribology and bearing engineering.	[SU4] Assessment of ability to use methods and tools
	[K7_W01] explains and describes, on the basis of general knowledge of the scientific disciplines forming the theoretical basis of Mechanics and Mechanical Engineering, the structure and principles of operation of mechanical systems and processes	The student is familiar with the design principles of advanced bearing systems	[SW1] Assessment of factual knowledge
Subject contents	Course content – lecture Friction, wear, and lubrication – fundamentals Wear mechanisms Radial and thrust bearings – development challenges Environmental aspects of bearing systems – use of unconventional materials and eco-friendly lubricants		
	Course content – laboratory Dry friction, particle emission, tribological experiments Testing of thrust bearings Bearing calculations according to standards Rolling-element bearing diagnostics Analysis of experimental data		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	100.0%	50.0%
	written exam	50.0%	50.0%
Recommended reading	Basic literature	FT Barwell - Bearing System D. Dowson - History of Tribology	

	Supplementary literature	Papers on tribology and bearing systems in scientific journals (Tribology International, Tribology Transactions, Wear, Lubrication Science, Lubricants)
	eResources addresses	
Example issues/ example questions/ tasks being completed	Identify methods for compensating for thermal deformation in large-scale thrust bearings. Challenges associated with implementing water lubrication in sliding bearings.	
Practical activities within the subject	Not applicable	

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