GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Tribology, PG_00064832		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
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
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		

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

<table>
<tr><td>Subject contents</td><td>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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Laboratory</td><td>100.0%</td><td>50.0%</td></tr>
<tr><td>written exam</td><td>50.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>FT Barwell - Bearing System

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

Document generated electronically. Does not require a seal or signature.