



## Subject card

Subject name and code	Fundamentals of Machine Design, PG_00041670						
Field of study	Transport and Logistics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study 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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Wojciech Litwin				
	Teachers		mgr inż. Agnieszka Barszczewska  dr inż. Magdalena Kunicka  dr hab. inż. Wojciech Litwin				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	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		10.0		45.0	100
Subject objectives	Student should have principles knowledge in Machine Elements Design						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	The student explains the phases and the course of the design and construction process. The student describes the basic types of machining and plastic working used in the construction of machines. Describes the construction and explains the principle of operation of detachable and non-detachable connections. The student calculates the basic types of detachable and non-detachable connections. Describes the design and calculates the shaft-hub connections. The student recognizes and calculates rolling bearings. The student recognizes and lists the types of plain bearings. The student distinguishes between hydrostatic and hydrodynamic bearings. The student recognizes the types of mechanical transmissions. Describes the construction and explains the principle of operation of the discussed types of transmissions. The student describes and explains the construction of chain and belt transmissions	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[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 explains the phases and the course of the design and construction process. The student describes the basic types of machining and plastic working used in the construction of machines. Describes the construction and explains the principle of operation of detachable and non-detachable connections. The student calculates the basic types of detachable and non-detachable connections. Describes the design and calculates the shaft-hub connections. The student recognizes and calculates rolling bearings. The student recognizes and lists the types of plain bearings. The student distinguishes between hydrostatic and hydrodynamic bearings. The student recognizes the types of mechanical transmissions. Describes the construction and explains the principle of operation of the discussed types of transmissions. The student describes and explains the construction of chain and belt transmissions.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
Subject contents	1. Design, types and calculations of permanent fastening machine elements. 2. Design, types and calculations of screw joints. 3. Design, types and calculations of hub and shaft fastening. 4. Design of shafts and axles. 5. Springs. 6. Design, types and calculations of ball and roller bearings. 7. Sliding bearings. 8. Gears. 9. Angular, planetary and worm gears. 10. Chain gears. 11. Belt gears.		
Prerequisites and co-requisites	Principles knowledge of technical drawing and mechanics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	substantive content of the work	50.0%	100.0%
Recommended reading	Basic literature	1. Dietrich M.: Podstawy Konstrukcji Maszyn, tomy 1,2 i 3 2. Kochanowski M.: Wybrane zagadnienia z Podstaw Konstrukcji Maszyn, skrypt PG 2002r. 3. Dobrzański J.: Rysunek Techniczny Maszynowy 4. Spotts M. F., Design of Machine Elements, Prentice Hall	
	Supplementary literature	none	
	eResources addresses	Adresy na platformie eNauczanie: PKM I (lato 2023/2024) TO TEN kurs! - Moodle ID: 36471 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36471">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36471</a>	

Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Ball and roller bearings, drawing, types, calculations method.</li> <li>2. Sliding bearings, drawing, types, explain P, V, PV, calculations procedure, PV diagram.</li> <li>3. Gears types.</li> <li>4. Planetary gears, description and drawing.</li> <li>5. Worm gear, properties, description, schematic.</li> </ol>
Work placement	Not applicable