GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Machine Design I, PG_00055204						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2026/2027			
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	English			
Semester of study	3		ECTS credits	6.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department Of Machine Design And Vehicles -> Faculty Of Mechanical Engineering And Ship Technology -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Grzegorz Rotta				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	30.0	0.0	0.0	75
	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	75		8.0	67.0		150
Subject objectives	Presentation of the general theoretical foundations (features, functions, constructional variants, application, etc.) regarding typical groups of machine parts, such as: screw joints, welded joints, shafts and axles, couplings, gears, brakes, bearings, drives, flexible elements.Acquainted with the basic calculation methods of typical machine elements and how to select catalog parts for the designed technical deviceLearning to create technical documentation effectively using theoretical knowledge and CAD software						

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U11	Is able to analyse the operation of devices and compare the construction solutions applying usage, safety, environmental, economic and legal criteria	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
K6_W04	Possesses knowledge on mechanics, including the processes of modelling mechanical systems, statics, kinematics and dynamics of rigid objects and basic knowledge on vibrations	[SW1] Assessment of factual knowledge
[K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	Is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools	[SU1] Assessment of task fulfilment
K6_U07	Is able to design a typical construction of a mechanical device, component or a testing station using appropriate methods and tools, adhering to the set usage criteria	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
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	[SW1] Assessment of factual knowledge

Subject contents

Presentation of the general theoretical foundations (features, functions, constructional variants, application, etc.) regarding typical groups of machine parts, such as: screw joints, welded joints, shafts and axles, couplings, gears, brakes, bearings, drives, flexible elements.Acquainted with the basic calculation methods of typical machine elements

Prerequisites and co-requisites

Basic knowledge of mechanics, strength of materials, technical drawing, materials science and any CAD program

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final exam	56.0%	40.0%
Tests	56.0%	30.0%
Design projects	56.0%	30.0%

Recommended reading

Basic literature	A set of scripts from the Basics of Machine Design published by the Gdańsk University of Technology
Supplementary literature	- A set of books "Basics of Machine Design" published by PWN, Warsaw - "PKM, t. I, II, III" edited by M. Dietrich, PWN, Warsaw - Any works on the "Basics of Machine Design" in Polish and English
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	- determining the element strength at a given load (general technical constructions, bolted joints, welded joints, shafts and axles) - determining the minimum dimensions of an element for specific operating conditions (general technical constructions, screw joints, welded joints, shafts and axles) - determining the maximum load of an element for given dimensions (general technical constructions, bolted joints, welded joints, shafts and axles) - determining the durability of parts, e.g. rolling bearings - selection of components for the designed simple machine (fasteners, bearings, other catalog elements) or mechanical devices (drives, e.g. motors, clutches, gears, bearings and others)
Work placement	Not applicable

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