GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Machine Design II, PG_00050280		
Field of study	Mechanical Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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	4	ECTS credits	8.0
Learning profile	general academic profile	Assessment form	exam
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	dr inż. Grzegorz Rotta	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	30.0	0.0	90

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	90	8.0	102.0	200

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 device

Learning to create technical documentation effectively using theoretical knowledge and CAD software

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U07	Designs a typical structure, mechanical device, subassembly, or test stand based on initial design assumptions and performance criteria. Uses appropriate analytical methods and computer tools.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
[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	Can specify assumptions for solving a design task, i.e., determine input data such as: loads, material, environmental constraints, normative guidelines. During design work uses popular engineering programs. Can present the results of work in the form of a presentation or report.	[SU1] Assessment of task fulfilment
K6_U11	Knows how devices work, can determine the principle or main mechanism of operation of a device. Can compare devices with similar applications mechanically and indicate the advantages and disadvantages of compared devices in terms of utility, safety, environmental, economic and legal criteria.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
K6_W08	He has mastered the theoretical foundations of designing individual machine parts and simple mechanical devices. He is able to select components from the manufacturer's catalog. He is able to propose the right material (both in terms of strength and from the point of view of economy and operation) and is able to propose the optimal manufacturing process for the designed part.	[SW1] Assessment of factual knowledge
K6_W04	Has basic knowledge of statics, kinematics, dynamics and vibration theory required for modeling machine parts, mechanisms, devices and mechanical systems.	[SW1] Assessment of factual knowledge

Subject contents

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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
Design projects	56.0%	30.0%
Tests	56.0%	30.0%
Final exam	56.0%	40.0%

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: Fundamentals of Machine Design II - Moodle ID: 44836 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44836 Fundamentals of Machine Design II - Exercises - Moodle ID: 44861 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44861 Fundamentals of Machine Design II - Design Project - Moodle ID: 44864 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44864
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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