



Subject card

Subject name and code	Machines Design 1, PG_00049768						
Field of study	Power Engineering, Power Engineering						
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	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Łubiński				
	Teachers		dr hab. inż. Jacek Łubiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30		4.0		16.0	50
Subject objectives	Repetition and strengthening of skills in technical mechanics, materials science and other, earlier engineering courses taken. Instruction on knowledge and skills required for the solution of practical tasks in mechanical engineering, with the use of science.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U01] can obtain information from literature and other sources, organize, interpret it and draw and formulate conclusions; has the ability to self-educate, interprets the results of completed engineering tasks, is able to design simple energy systems and their systems		Development of skills in search, evaluation and classification of information required for the solution of tasks in mechanical engineering.		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K6_W04] has structured knowledge of mechanics, including the issues of material strength and general principles of shaping structures, necessary to conduct basic strength analyzes and design simple mechanical or construction systems for power industry or environmental engineering; knows the basics of machine construction and the most commonly used construction and operating materials		Capacity to use knowledge and skills in the sciences for tackling of technological tasks.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Evaluation of reactions, profiles of moments of forces in members. Use of the equations of static equilibrium for engineering tasks. Evaluation of static and dynamic reactions. Component stress and equivalent stress. Types of engineering stress. Evaluation of geometric parameters of members. Fundamentals of threaded bolt connections and welded connections - calculation models. Safety factor. Allowable stress. Friction in mechanical engineering.						
Prerequisites and co-requisites	Competency in technical mechanics and strength of materials: addition and subtraction of forces, evaluation of reactions in static systems, evaluation of load and support conditions in mechanical systems, physical properties of materials commonly used in machine design, basic knowledge on steels. Mathematics: calculus, symbolic equation manipulation, creation and solution of sets of linear equations, trigonometry, vector calculus, integral and differential calculus.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test x2	45.0%	100.0%
Recommended reading	Basic literature	Fundamentals of Machine Design, Engineering Graphics, Engineering Materials, Mechanical Engineer's handbook Machine Design by Robert L. Norton	
	Supplementary literature	Fizyka, Haliday & Resnick, The Fabric of Reality, D.Deutsch	
	eResources addresses	Adresy na platformie eNauczanie: Machines Design 1, PG_00055075 2023/24 - Moodle ID: 34343 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=34343	
Example issues/ example questions/ tasks being completed	Evaluation of component stresses. Evaluation of equivalent stress. Evaluation of stress in members subjected to complex load cases (e.g. tension+torsion+bending). Evaluation of reaction forces in static cases. Evaluation of bending and torsional moment profiles, and of transverse and axial forces. Engineering calculation methods in premanent and removable connections used in mechanical engineering.		
Work placement	Not applicable		