



## Subject card

Subject name and code	Machine Design 3, PG_00042104						
Field of study	Power Engineering, Power Engineering						
Date of commencement of studies	October 2022	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	3	Language of instruction			English		
Semester of study	5	ECTS credits			3.0		
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	0.0	0.0	0.0	30.0	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		7.0		38.0	75
Subject objectives	Carrying out work related to the design of simple machine components in order to consolidate the the ability to use knowledge and skills in the field of mechanics, strength of materials and the basics of machine design.						

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	A practical exercise in the application of the ability to search for sources in the course of the implementation of simple design issues in the field of mechanical engineering.	[SU2] Assessment of ability to analyse information [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	Ability expansion in search, analysis, and gathering of information materials, typical machine components, recommendations, standards and calculation methods, as well as formulating criteria for assessing the correctness of the implementation of design works.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic	Practical use of basic engineering models for the design of machine components, including connections, bearings, correct shaping with the use of available manufacturing techniques.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_W12] has basic knowledge of the life cycle and repairs of energy equipment in the field of thermal power stations, thermal and energy systems and heating systems, internal combustion engines and compressors as well as rotating machines	Solid knowledge and skills in the practical application of mechanics, material strength and fundamentals of machine design.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects	
Subject contents	Design tasks necessary to produce design documentation for selected, simple machine components, requiring the necessary work steps: determining the project requirements for the task topic, defining the basic technical parameters of the project, collection of catalogue data, standardised data, textbook data, etc. necessary to carry out the task, selection of computational analysis methods and criteria for assessing the correctness of the implementation of individual stages of the project, carrying out calculations and evaluating the results; selection and correction of design parameters (e.g. material grade, permissible stresses, load state and design stresses, compliance of dimensions of individual elements of the designed part/subassembly of the machine), preparation of a clear, legible, comprehensible and complete report, including information on the methodology and course of calculations, sources of technical information, results of technical/design analysis and assessment of the correctness of the work performed, development of a graphic design (technical, assembly and detailed drawings) of the designed element/subassembly of the machine.		
Prerequisites and co-requisites	Completed courses in Technical Mechanics and Strength of Materials (engineering degree level), as well as Engineering Graphics, Machine Design 1 and Machine Design 2 for the field of Energy Technologies. Possibly completed equivalent courses in engineering graphics and fundamentals of mechanical engineering at the engineering level		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	design project reports	60.0%	100.0%
Recommended reading	Basic literature	Mechanical Engineer's Guide (European editions recommended) Fundamentals of Machine Design Industry Standards for Engineering Graphics and machinery drawing, typical machine parts (e.g. screws) and Other. Catalogues of finished products and subassemblies available to customers present on the market Handbook of technical machine drawing (European edition recommended)	

	Supplementary literature	The Structure of Reality, David Deutsch A Brief History of Time, by Stephen Hawking The Blade of Genius, James Burke, Robert Ornstein Paragraph 22, Joseph Heller The Trial, Franz Kafka Animal Farm, George Orwell
	eResources addresses	Adresy na platformie eNauczenie: Machine Design 3, PG_00042104 2024/25 - Moodle ID: 42225 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=42225">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=42225</a>
Example issues/ example questions/ tasks being completed	Design of the shaft according to the given scheme and requirements, including the selection of rolling bearings Design of the welded bracket, along with the selection of bolts attaching the bracket to the support	
Work placement	Not applicable	

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