



Subject card

Subject name and code	Modelling in machine design, PG_00064817						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2024/2025		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute Of Mechanics And Machine Design -> Faculty Of Mechanical Engineering And Ship Technology -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Łubiński					
	Teachers	dr hab. inż. Michał Wodtke dr hab. inż. Jacek Łubiński					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	0.0	60
	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	60		7.0		33.0	100
Subject objectives	Improvement and integration of the knowledge and skills gained on earlier stages of engineering training. Opportunity to gain a wide scope of understanding of the use of methods used for the development of engineering models of phenomena and processes in real - life cases of engineering tasks. Obtainment of connections between the skills in use of modern tools for engineering analysis and the reality of practical activity on the basis of numerous examples of tasks realised in co - operation with industrial organisations.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W02] demonstrates a structured and theoretically grounded knowledge of the key topics in Mechanical Engineering enabling the analysis and modelling of mechanical systems, processes and devices	practical competence in structured and theoretically based knowledge covering key issues in the field of Mechanics and Machine Design allowing for the analysis and modeling of systems, processes and mechanical devices	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K7_W11] interprets social, economic, legal (including industrial and intellectual property laws), and other non-technical aspects of engineering activities, and includes them into engineering practice	the ability to interpret social, economic, legal (including those related to the protection of industrial property and copyright) and other non-technical conditions of engineering activities and to take them into account in engineering practice	[SW1] Assessment of factual knowledge
	[K7_U15] evaluates the feasibility of advanced methods and tools for solving complex engineering tasks of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose	skillfully assesses the usefulness of advanced methods and tools for solving a complex engineering task of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
	[K7_U02] formulates and solves technical problems specific to Mechanics and Mechanical Engineering using appropriate tools including CAD and MES systems, and prepares technical documentation	the ability to formulate and solve technical problems specific to Mechanics and Machine Design, using appropriate tools, including CAD and MES systems, as well as to develop technical documentation of machines	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
Subject contents	Mechanical devices' and machine failure analysis in real-life industrial environment. Evaluation of the models of machine components' support and load in real - life conditions of use on the basis of scattered sources of information. Fatigue of materials - ammendment and broadening of the basic scope. Numerical analysis of selected technical tasks with the use of the ANSYS environment.		
Prerequisites and co-requisites	Completed courses in fundamentals of machine design, engineering mechanics, materials science, manufacturing technologies (machining, welding, plastic forming), engineering graphics or engineering drawing. Understanding of the physical foudations of the functioning of machines and basics of machine construction.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	practical training completion	60.0%	100.0%
Recommended reading	Basic literature	Fundamentals of Machine Design Engineering Graphics for Mechanical Engineers Metal cutting handbook Plastic forming of metals handbook Welding engineers handbook Mechanical Engineer's handbook Machine Design by Robert L. Norton	
	Supplementary literature	Physics, Resnick & Haliday The Fabric of Reality, D.Deutsch The Emperor's New Mind, Roger Penrose	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	Analytical evaluation of the causes of a machine failure in an industrial facility. Investigation into the load and support model and detailed reconstruction of the functional determinants pertaining to the machine. Numerical analysis of exemplary tasks in machine elements' engineering.		
Work placement	Not applicable		

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