



Subject card

Subject name and code	Engineering design, PG_00061900						
Field of study	Materials Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Obligatory subject group 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	2		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department Of Polymer Technology -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Włoch				
	Teachers		dr inż. Marcin Włoch				
			mgr inż. Przemysław Gnatowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	15.0	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		5.0		60.0	125
Subject objectives	Obtaining basic knowledge in the field of engineering design, including engineering calculations and engineering graphics						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes.		Student understands the essence and complexity of engineering design, including the ability to analyze the problem, perform strength analysis and prepare a technical drawing		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.		Student has the ability to solve basic problems related to engineering design, including simple tasks related to technical drawing and engineering calculations.		[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work		
	[K6_W03] Has knowledge of materials science and can relate the properties of materials with their structure and composition, knows the theoretical description of phenomena occurring in materials subjected to external factors.		Student is able to indicate materials that could be used in a given engineering application taking into account presented requirements		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.		Student has the ability to analyze basic issues related to the strength of materials and technical drawing, in terms of theory and solving simple tasks and practical problems.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	LECTURE / TUTORIAL: 1. Designing processes, objects and materials as a basic element of engineering activities 2. Engineering design methods and techniques (problem formulation and analysis, methods of evaluation and selection of solutions) 3. Strength characteristics (introduction to mechanics and strength of materials; stresses, strains and strength criteria; strength calculations) 4. Technical drawing (principles of preparation and types of technical drawings; projection; views, sections and drawing layouts; principles of dimensioning; tolerances and fits; roughness) 5. Drawing selected structures (elements of machines and devices, including drive elements; detachable and inseparable connections) PROJECT: 1. Selected elements of pressure vessel design 2. Drawing design (execution design) of an element made using 3D printing technology																	
Prerequisites and co-requisites	Knowledge from the course "Fundamentals of materials engineering"																	
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Engineering design tasks (engineering calculations, 3D printing project)</td><td>100.0%</td><td>25.0%</td></tr><tr><td>Engineering calculations colloquia</td><td>50.0%</td><td>25.0%</td></tr><tr><td>Theoretical colloquium</td><td>50.0%</td><td>25.0%</td></tr><tr><td>Engineering graphics tasks (technical drawing)</td><td>100.0%</td><td>25.0%</td></tr></table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Engineering design tasks (engineering calculations, 3D printing project)	100.0%	25.0%	Engineering calculations colloquia	50.0%	25.0%	Theoretical colloquium	50.0%	25.0%	Engineering graphics tasks (technical drawing)	100.0%	25.0%
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Recommended reading	Basic literature	P. Gendarz, S. Salamon, P. Chwastyk: Projektowanie inżynierskie i grafika inżynierska, PWE, Warszawa 2014 W.M. Lewandowski, M. Ryms: Maszynoznawstwo chemiczne: podstawy wytrzymałości i przykłady obliczeń, PWN, Warszawa 2017 T. Dobrzańsk: Rysunek techniczny maszynowy, PWN, Warszawa 2021																
	Supplementary literature	M.E. Niezgodziński, T. Niezgodziński: Wzory, wykresy i tablice wytrzymałościowe, PWN/WNT, Warszawa 2022 M.E. Niezgodziński, T. Niezgodziński: Zadania z wytrzymałości materiałów, PWN/WNT, Warszawa 2022																
	eResources addresses	Adresy na platformie eNauczanie: Projektowanie inżynierskie (PG_00061900) - Moodle ID: 35376 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35376																
Example issues/ example questions/ tasks being completed																		
Work placement	Not applicable																	

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