



Subject card

Subject name and code	Engineering design, PG_00061900						
Field of study	Materials Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Włoch					
	Teachers	dr inż. Marcin Włoch					
Lesson types	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_K01] is ready to continuously expand his knowledge in materials engineering and related sciences, to critically evaluate this knowledge, and to recognise its importance in solving practical and cognitive problems; is aware of his own limitations and knows when to seek expert advice.	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_W05] has knowledge of mechanics, technology, and electrical engineering, including engineering graphics, as well as the use of computer-aided design and 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_U01] is able to analyse and solve complex and non-standard scientific and technical problems in materials engineering based on his knowledge, using appropriate analytical, computational, numerical, simulation, or experimental methods	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	<p>Course content – lecture</p> <p>1. Designing processes, objects and materials as a basic element of engineering activities</p> <p>2. Engineering design methods and techniques (problem formulation and analysis, methods of evaluation and selection of solutions)</p> <p>3. Strength characteristics (introduction to mechanics and strength of materials; stresses, strains and strength criteria; strength calculations)</p> <p>4. Technical drawing (principles of preparation and types of technical drawings; projection; views, sections and drawing layouts; principles of dimensioning; tolerances and fits; roughness)</p> <p>5. Recording selected structures (elements of machines and devices, including drive elements; detachable and inseparable connections)</p>																	
Prerequisites and co-requisites	Knowledge from the course "Fundamentals of materials engineering"																	
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 842 794 869">Subject passing criteria</th> <th data-bbox="799 842 1137 869">Passing threshold</th> <th data-bbox="1142 842 1481 869">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 875 794 925">Exercise tests (engineering calculations)</td> <td data-bbox="799 875 1137 925">50.0%</td> <td data-bbox="1142 875 1481 925">30.0%</td> </tr> <tr> <td data-bbox="456 931 794 958">Drawing tasks</td> <td data-bbox="799 931 1137 958">50.0%</td> <td data-bbox="1142 931 1481 958">30.0%</td> </tr> <tr> <td data-bbox="456 965 794 992">Lecture test</td> <td data-bbox="799 965 1137 992">50.0%</td> <td data-bbox="1142 965 1481 992">10.0%</td> </tr> <tr> <td data-bbox="456 999 794 1025">Project tasks</td> <td data-bbox="799 999 1137 1025">50.0%</td> <td data-bbox="1142 999 1481 1025">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exercise tests (engineering calculations)	50.0%	30.0%	Drawing tasks	50.0%	30.0%	Lecture test	50.0%	10.0%	Project tasks	50.0%	30.0%
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Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> <li>• Projection and dimensioning of objects</li> <li>• Construction of chemical reactors</li> <li>• Types and fabrication technologies of joints</li> <li>• Methods of representing detachable and non-detachable joints</li> <li>• Strength of engineering materials and basic strength calculations</li> <li>• Tensile stresses in cylindrical vessels</li> <li>• Tensile, shear, and compressive stresses in joints</li> <li>• Design calculations for a cylindrical vessel</li> <li>• Design of an element and its 3D printing</li> </ul>																	
Practical activities within the subject	Not applicable																	

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