GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Engineering design, PG_00061900		
Field of study	Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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 mgr inż. Przemysław Gnatowski dr inż. Ewa Głowińska	

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

eNauczanie source addresses:
Moodle ID: 5000 2025/2026 - Projektowanie inżynierskie
https://enauczanie.pg.edu.pl/2025/course/view.php?id=5000

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_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
[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

Subject contents

Course content – lecture

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. Recording selected structures (elements of machines and devices, including drive elements; detachable and inseparable connections)

Prerequisites and co-requisites

Knowledge from the course "Fundamentals of materials engineering"

Assessment methods and criteria

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%

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. Dobrzański: 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	
Example issues/ example questions/ tasks being completed	• Projection and dimensioning of objects • Construction of chemical reactors • Types and fabrication technologies of joints • Methods of representing detachable and non-detachable joints • Strength of engineering materials and basic strength calculations • Tensile stresses in cylindrical vessels • Tensile, shear, and compressive stresses in joints • Design calculations for a cylindrical vessel • Design of an element and its 3D printing	
Practical activites within the subject	Not applicable	

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