GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Science of Mechanics and Strength of Materials, PG_00048442
Field of study	Chemistry in Construction Engineering

Date of commencement of studies	October 2023	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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam

Conducting unit	Department of Energy Conversion and Storage -> Faculty of Chemistry

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Katarzyna Januszewicz
	Teachers	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	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	35.0	100

Subject objectives	Introduce students to issues related to technology, engineering, manufacturing technology in relation to the construction industry.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_K03	The student recognizes the five basic mechanical stresses (tensile stresses, shear stresses, buckling stresses and stresses). Classifies, describes and draws the basic connections used in the chemical industry. Calculates the basic dimensions of the tank or installation components. Recognizes the basic types of valves and fittings in the chemical industry. The student knows the division of construction materials used in the construction of chemical industry installations. The student can draw an object in three projections and in axonometry and cross-section.	[SK5] Assessment of ability to solve problems that arise in practice
	K6_U05	The student is able to use industry standards. The student can select the basic elements of the chemical industry fittings to the tank/reactor used in the industry. Calculates the basic dimensions of the tank or installation components.	[SU4] Assessment of ability to use methods and tools

Subject contents	- Selected sections of the strength of materials for structural components of the building and its installation (sanitary, heating, gas, air conditioning).
	- Connections used in construction technology,, among which are listed: disjoint (threaded, flush mounted) and inseparable (welded, riveted).
	- Construction materials used in industry, including: metals (ferrous and non-ferrous), natural materials (wood, leather, cork, rubber), and materials (ceramics, glass, plastics, insulation, materials change type
	- Fittings and equipment installed in the building: warmer water storage tanks, pipelines, valves, fittings.
	- Solving engineering problems/ taska, selection of fittings. The ability to read and analyze technical drawwings of devices and installations.

Prerequisites and co-requisites	

Assessment methods and criteria			
	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tests	51.0%	50.0%
	Exam	51.0%	50.0%

Recommended reading	Basic literature	Praca zbiorowa, Mały Poradnik Mechanika t.I i II, WNT, Warszawa, 1988,
		W.Lewandowski, Maszynoznawstwo chemiczne, Ćwiczenia projektowe, Wyd. PG., 1979,
		W.Lewandowski, A.Melcer, Zadania z maszynoznawstwa chemicznego, Wyd.PG, 2011.
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Analysis of the state of stresses affecting the used structural element (transport screw, hook).
	2. Steiner theorem general formula and explanation on the example of a square.
	3. Buckling.
	4. The cord polygon method (graphical method) to determine the resultant of the system of forces.
	5. Draw a selected structural element in the half-view and in the half-section.
	6. Calculation of the tank wall thickness.
	7. Tasks concerning the beam: reactions of statistically determinate beams, bending and torsional moments.

Work placement	Not applicable