GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Theory of Machines and Engineer Graphies, PG_00054687		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
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	6.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Energy Conversion and Storage -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Ryms	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	30.0	0.0	75

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	75	10.0	65.0	150

Subject objectives

Student is able to recreate spatial elements on a drawing plane, using orthogonal and axonometry, as well as cross-section projections. Is familiar with basic dimensioning guidelines and how to prepare technical drawings (working and assembly drawings). Student recognizes the tension strength in technology. Classifies, describes and draws the basic connections used in the chemical industry. Calculates the dimensions of the tank or installation. Recognises the basic types of valves and fittings found in chemical industry.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U10	The student can use known methods of preparing technical drawings and mathematical models describing strength of materials.	[SU1] Assessment of task fulfilment
K6_W10	The student has mastered the knowledge related to the use of technical drawing, graphical presentation of machine elements and mechanical systems, as well as knowledge of basic strength calculations of objects.	[SW1] Assessment of factual knowledge

Subject contents

Over the course of lectures, student familiarizes himself with methods of spatial element recreation in a the drawing plane, theory of engineering design and selected methods of strength calculations of the materials. The scope of program includes, in particular:
- Introduction to the subject (formats, lines, scales, technical writing),
- Methods of imaging three-dimensional objects on a drawing plane (object projections, finding the missing projection and isometric projections, cross-sections, revolved sections with dimensioning guidelines),
- Working and assembly drawings preparation,
- Disjoint connection drawings (screw joints, pipe threaded connections, bolts, fittings and elbows, thread protections against dismantling),
- Drawings of permanent joints (welded, soldered and riveted joints),
- Drawings of selected elements from heating and plumbing installation and armature (with emphasis on tanks, piping, valves, sight glasses, liquid level gauges and measuring points). Different examples from chemical industry.
- Full installations projects (drawings and calculations).Drawing fittings elements of chemical, food and pharmaceutical installations with special attention to tanks, piping, valves, sight glasses, liquid level gauges and measuring connectors. Tank calculations. Selection from the catalogues the tank fittings and equipments. Design of the tank (calculations, drawings).

Prerequisites and co-requisites

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	20.0%
	Midterm colloquiums	60.0%	40.0%
	Drawings dokumentation	60.0%	10.0%
	Project	60.0%	30.0%
Recommended reading	Basic literature	1. M. Ryms, W.M. Lewandowski, Chemical Theory of Machines, PWN 2017, 2. W.M. Lewandowski, Maszynoznawstwo chemiczne, Gdańsk 1998, 3. T. Dobrzański, Rysunek techniczny maszynowy, WNT 2013, 4. M. Kochanowski, Zapis konstrukcji z geometrią wykreślną, Wyd. PG 2002, 5. K. Paprocki, Zasady zapisu konstrukcji, OWPW, Warszawa 2000,	
	Supplementary literature	websites materials, programs instructions, catalogues and industry standards	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Learning about technical drawing (e.g.: prepare orthogonal projections of an item on the basis of its axonometric projection and vice versa, dimension a given element, draw a following item as a half-view-half section). Drawing fittings of the chemical, food and pharmaceutical industries with emphasis on tanks, pipelines, valves, sight glasses, liquid level gauges and measuring connectors (e.g.: draw a vertical sight glass, what are the possible variants of its construction, what it is used for). Tank design calculations. Selection of tank fittings. The design of the tank containing calculations and drawings.		
Work placement	Not applicable		