



Subject card

Subject name and code	Theory of machines for chemists, PG_00052339						
Field of study	Chemical Technology						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
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			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Michał Ryms					
	Teachers	dr inż. Anna Dettlaff dr hab. inż. Michał Ryms dr hab. inż. Katarzyna Januszewicz dr inż. Anna Kuczyńska-Łażewska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	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	45	5.0		25.0		75
Subject objectives	To provide students with technical and engineering problems, such as.: technical drawing, strength of materials, construction materials, connection of machines and parts of devices and apparatus in the chemical industry.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U11	Student has knowledge about the distribution of construction materials used for construction of the plant industry.			[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_K03	Is aware of the advantages arising from the practical application of appropriate strength of materials calculations in engineering and in the chemical industry.			[SK2] Assessment of progress of work		
	K6_W04	Student identifies five basic stress in strength of materials in engineering (tensile, compressive, shearing buckling and contact stress). Classifies, describes and draws a fundamental connection used in the chemical industry. Calculates the basic dimensions of the tank or installation elements. Recognize the basic types of valves and fittings of chemical industry. Knows the distribution of construction materials used for construction of the plant industry			[SW1] Assessment of factual knowledge		

Subject contents	Program Content: - Selected sections of the strength of the materials for the design of tanks and pipes. - The connections used in the chemical industry, among which are listed: disjoint (threads, call keyways) and shaft (welded, welded, riveted). - Materials used in construction of chemical industry, including metals (Ferrous and non-ferrous), natural materials (wood, leather, cork, rubber) and artificial (ceramics, glass, plastics). - Fittings chemical industry, food and pharmaceutical industries with emphasis on tanks, piping, valves, sight glasses, connector and measurement pipes. - The calculation, drawing, detailing the constituent elements of structural devices the chemical industry such as the wall of the tank, screw the lids, legs reactors, spindle valves, etc.			
Prerequisites and co-requisites	No requirements			
Assessment methods and criteria	Subject passing criteria		Passing threshold	Percentage of the final grade
	Participation in lectures		80.0%	50.0%
	Tests in the semester		60.0%	20.0%
	Test		60.0%	20.0%
	Folder (Project)		60.0%	10.0%
Recommended reading	Basic literature	M. Ryms, W.M. Lewandowski, Chemical Theory of Machines, PWN 2017; Praca zbiorowa, Mały Poradnik Mechanika t.I i II, WNT, Warszawa, 1988; W.Lewandowski, Maszynoznawstwo chemiczne, Wyd. PG., 1998, W.Lewandowski Handout at home page of the Department, (https://chem.pg.edu.pl/kkime/projekt-z-maszynoznawstwa-chemicznego)		
	Supplementary literature	No requirements		
	eResources addresses	Adresy na platformie eNauczanie: MASZYNOZNAWSTWO - TCh 2023 - Moodle ID: 16627 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16627		
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> - 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). - Designing of valves (drawings and calculations). Drawing fittings elements of chemical, installations with special attention to tanks, piping, valves, sight glasses, liquid level gauges and measuring connectors. Selection from the catalogues the tank fittings and equipments. 			
Work placement	Not applicable			

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