



Subject card

Subject name and code	Vacuum technology, PG_00037288						
Field of study	Technical Physics						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional subject group 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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Katedra Fizyki Atomowej, Molekularnej i Optycznej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sebastian Bielski				
	Teachers		dr inż. Sebastian Bielski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		2.0		18.0	50
Subject objectives	Knowledge of the following concepts concerning modern vacuum technology: properties of gases surface processes (adsorption and desorption) creating a vacuum measuring a vacuum vacuum components, construction, and leak detection						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W07		The describes the construction, operation and use of vacuum devices.		[SW1] Assessment of factual knowledge		
	K6_U02		The student carries out simple experiments by using vacuum devices.		[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	K6_U04		The student carries out simple experiments by using vacuum devices.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	K6_W08		The student is able to plan and prepare for a complex laboratory exercise.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
Subject contents	1) The concept of vacuum in physics and technology 2) The properties of dilute gases 3) The gas flow and surface phenomena 4) Vacuum preparation 5) Mechanical vacuum pumps 6) Jetvacuum pumps 7) Sorption pumps 8) Vacuum measurement 9) Leak Detection 10) Elements of vacuum systems						
Prerequisites and co-requisites	None						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratories, reports, oral presentations	100.0%	49.0%
	written test	50.0%	51.0%
Recommended reading	Basic literature	S. Bielski, materials published on enauczanie https://enauczanie.pg.edu.pl/moodle/mod/page/view.php?id=1946810 "Modern vacuum physics" Austin Chambers CRC Press 2004	
	Supplementary literature	Materials and data available on the websites https://www.leyboldproducts.com/media/pdf/87/a8/be/FVT_Fundamentals_of_Vacuum_Technology_EN58774555441f3.pdf http://www.idealvac.com/files/manuals/Kinney_Piston_Vacuum_Pump_Brochure.pdf https://www.agilent.com/cs/library/catalogs/public/catalog-diffusion-pumps-agilent.pdf http://www.idealvac.com/files/literature/03_Edwards_2011_Vapour_Diffusion_Pumps.pdf http://www.idealvac.com/files/brochures/Pfeiffer-Adixen-Leak-Detectors-Brochure.pdf	
	eResources addresses	Adresy na platformie eNauczenie: Technika próżniowa_24/25 - Moodle ID: 38723 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38723	
Example issues/ example questions/ tasks being completed	Project of the vacuum system. Physical basis of the vacuum measurements. Construction, operation and properties of a rotary pump.		
Work placement	Not applicable		

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