



Subject card

Subject name and code	Pneumatic Drive and Control, PG_00039979						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
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	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Paweł Załuski				
	Teachers		dr inż. Paweł Załuski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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		5.0		15.0	50
Subject objectives	The aim of the course is to acquaint the student technology use compressed air to drive and control equipment.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle		The student has a structured knowledge of the preparation of compressed air, construction of pneumatic elements and operation of systems with pneumatic and electropneumatic control		[SW1] Assessment of factual knowledge		
	[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions		The student explains the use of compressed air to drive and control machines. The student describes properties and preparation of compressed air. The student selects actuators and motors and elements of pneumatic control. The student designs simple pneumatic and electropneumatic control systems.		[SU4] Assessment of ability to use methods and tools		
Subject contents	LECTURES General information about pneumatic drives. Current state and development perspectives of pneumatics. Structure of pneumatic control system. Physical properties of air. Humidity. Preparation of compressed air: compressors, filtration and drying, cleanness grades. Pneumatic drive units: construction and types of pneumatic cylinders, pendulous cylinders, pneumatic motors. Pneumatic control components: directional valves, throttle valves, logic and signal conditioning components, graphic symbols. Basic systems of pneumatic drive and control: systems with single and double acting cylinder, systems with logic valves, speed control. Intuition method of pneumatic systems design: movement cyclograms, sequential control. LABORATORY EXERCISES Designing and assembling on a simulation board systems of drive and sequential control in function of distance and time, systems with flux sensors and pneumatic controllers, electropneumatic control systems.						
Prerequisites and co-requisites	Fluid mechanics and thermodynamics. Knowledge of pneumatic basics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Midterm colloquium		56.0%		70.0%		
	Practical exercise		56.0%		30.0%		

Recommended reading	Basic literature	Szenajch W.: Napęd i sterowanie pneumatyczne. WNT Warszawa 1997. Niegoda J., Pomierski W.: Sterowanie pneumatyczne. Skrypt PG. Gdańsk 1998
	Supplementary literature	Szenajch W.: Przyrządy, uchwyty i sterowanie pneumatyczne. WNT Warszawa 1983. Deppert W., Stoll K.: Pneumatische Steuerungen. Vogel Buchverlag. Wuerzburg 1994 Siemieniako F.: Napędy i sterowanie pneumatyczne. Oficyna Wydawnicza Politechniki Białostockiej. Białystok 2013
	eResources addresses	Adresy na platformie eNauczenie: Napędy i sterowanie pneumatyczne, W, MiBM, sem.06, letni 22/23 - Moodle ID: 28672 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=28672
Example issues/ example questions/ tasks being completed	Draw a diagram of a pneumatic system implementing the selected movement cyclogram	
Work placement	Not applicable	