



## Subject card

Subject name and code	Pneumatic Drive and Control Systems, PG_00055499						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
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	Institute of Mechanics and Machine Design -> 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	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	The aim of the course is to familiarise the student with compressed air technology as applied to drive and control machinery.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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		
	[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		
Subject contents	LECTURES General information on pneumatic drives. State and perspectives of pneumatics development. Pneumatic control system structure. Physical properties of air. Moisture content. Preparation of compressed air: compressors, filtration and drying, purity classes. Pneumatic drive units: construction and types of pneumatic cylinders, swinging cylinders, pneumatic motors. Pneumatic controls: separating valves, throttling valves, logic and signal forming elements, graphic symbols. Basic pneumatic drive and control systems: single and double acting actuator systems, logic valve systems, motion speed control. Intuitive method of pneumatic systems design: motion cyclics, sequential control. LABORATORY EXERCISES Design and assembly on a simulation board of drive systems and sequential control systems as a function of distance and time, systems with jet sensors and pneumatic controllers, and electropneumatic control systems						
Prerequisites and co-requisites	Knowledge of fluid mechanics and thermodynamics. Knowledge of basic pneumatics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	tests during the semester		56.0%		70.0%		
	practical exercises		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	
Example issues/ example questions/ tasks being completed	Draw a diagram of a pneumatic system implementing the selected motion cyclogram	
Work placement	Not applicable	