GDAŃSK UNIVERSITY OF TECHNOLOGY

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. Intuitional 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 eNauczanie: Napędy i sterowanie pneumatyczne, W, MiBM, sem.06, letni 22/23 - Moodle ID: 28672 https://enauczanie.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	