



## Subject card

Subject name and code	Hydraulics and Pneumatics, PG_00039888						
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			Obligatory subject group in the field of study 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			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Leszek Osiecki					
	Teachers	dr inż. Marcin Bąk dr hab. inż. Leszek Osiecki dr inż. Piotr Patrosz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						
Hydraulika i Pneumatyka, L, MiBM, sem. 05, zimowy 22/23 (M:31546W0) - Moodle ID: 26726 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26726">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26726</a>							
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	6.0	49.0	100		
Subject objectives	Acquainting with physical phenomena, the basics of design and operation of hydraulic and pneumatic drive and control systems						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U07] is able to design a typical construction of a mechanical device, component or a testing station using appropriate methods and tools, adhering to the set usage criteria	The student acquires knowledge about the principles of operation, application and exploitation of hydraulic and pneumatic drive and control systems			[SU1] Assessment of task fulfilment		
	[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 acquires knowledge about the principles of operation, application and exploitation of hydraulic and pneumatic drive and control systems			[SW1] Assessment of factual knowledge		
Subject contents	LECTURE:Structure of hydraulic and pneumatic drive and control. Properties of working fluid and air. System pressure losses and their calculation. Flows through the clearances. Basic elements and hydrostatic and pneumatic systems of machines: pumps, motors, actuators, valves, filters, accumulators, compressed air units. Basic calculations of hydraulic and pneumatic drive systems.LABORATORIES:Practical familiarization with the structure and operation of hydraulic and pneumatic elements, as well as self-assembly of basic systems						
Prerequisites and co-requisites	Physics						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Final exam	56.0%			66.0%		
	Laboratory pass	56.0%			34.0%		

Recommended reading	Basic literature	1. Osiecki A.: Hydrostatyczny napęd maszyn. WNT, Warszawa 1998 2. Szejnach W.: Napęd i sterowanie pneumatyczne. WNT, Warszawa 1997 3. Balawender A. i inni: Laboratorium napędów hydraulicznych. Część 1. Podstawy hydrauliki. Gdańsk 1996 4. Niegoda J., Pomierski W.: Sterowanie pneumatyczne. Ćwiczenia laboratoryjne. Skrypt PG, Gdańsk 1998
	Supplementary literature	1. Dindorf R.: Napędy płynowe. Podstawy teoretyczne i metody obliczania napędów hydraulicznych i pneumatycznych. Wydawnictwo Politechniki Świętokrzyskiej. Kielce 2009
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	