



Subject card

Subject name and code	, PG_00058890						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Hydrauliki i Pneumatyki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Paweł Śliwiński				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	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	45		0.0		0.0	45
Subject objectives	Learning the principles of operation and diagnosis of hydraulic systems						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W11] possesses organized knowledge useful in understanding ex-technical conditioning connected with performing the profession of an engineer and taking it into consideration in engineering practice; possesses well-established knowledge within the range of intellectual property, management and organization of manufacturing processes, including the management and life-cycle of a product		The student can assess the need to use elements and entire hydraulic systems in the drive systems of machines and devices. The student can determine the working conditions of a given element in a hydraulic system.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_W06] possesses organized, profound knowledge necessary for designing and optimization of complex technological processes, modelling and calculations using numerical methods, knows modern manufacturing methods and tools for designing manufacturing processes of machines, devices, their elements and components		The student can explain the structure and operation of the basic elements of the hydraulic system and determine the proper operating conditions of these elements.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_U01] is able to acquire information from specialist literary sources and other sources regarding the construction and operation of machines and related disciplines in polish and in a foreign language, is able to conduct a self-learning process, is able to synthesize the information, form conclusions and justify opinions		The student can search the literature for information on the design and operation of hydraulic components and systems and draw conclusions.		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		

Subject contents	<p>1. Measurements in the laboratory of hydraulics and pneumatic systems for data collection and measurement.</p> <p>2. Wear of the machinery components and monitoring of oil.</p> <p>3. Preparation of the hydraulic system to operate.</p> <p>4. Methods for determining of pressure losses in the internal channels of pump and hydraulic and pneumatic motor.</p> <p>5. Determination of the theoretical displacement of hydraulic and pneumatic machine.</p> <p>6. Methods of testing the motor and the pump at a constant low speed. Starting torque.</p> <p>7. Methods of description of the losses in hydraulic and pneumatic motors.</p> <p>8. Methods of testing of the hydraulic and pneumatic systems components at low ambient temperatures.</p> <p>9. Methodology of the testing of the seals in the reciprocating and rotary motion.</p> <p>10. Methods of dewatering oil. Methods for determining the amount of water in oil.</p> <p>11. Method of the thermal monitoring and diagnosis of hydraulic devices.</p>											
Prerequisites and co-requisites	Basic knowledge of hydraulics and pneumatics.											
Assessment methods and criteria	<table border="1" data-bbox="448 1068 1489 1173"> <thead> <tr> <th data-bbox="448 1068 794 1099">Subject passing criteria</th> <th data-bbox="794 1068 1141 1099">Passing threshold</th> <th data-bbox="1141 1068 1489 1099">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1099 794 1131">Lecture</td> <td data-bbox="794 1099 1141 1131">56.0%</td> <td data-bbox="1141 1099 1489 1131">75.0%</td> </tr> <tr> <td data-bbox="448 1131 794 1173">Laboratory</td> <td data-bbox="794 1131 1141 1173">56.0%</td> <td data-bbox="1141 1131 1489 1173">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture	56.0%	75.0%	Laboratory	56.0%	25.0%
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Lecture	56.0%	75.0%										
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>1. A. Osiecki, Hydrostatyczny napęd maszyn, WNT, W-wa 1998.</p> <p>2. A. Balawender and others, Laboratorium napędów hydraulicznych. Part 1. Podstawy hydrauliki. Wyd. IMP PAN, Gdańsk 1996.</p> <p>3. S. Stryczek, Napęd hydrostatyczny, volume I i II, WNT, W-wa 1997.</p> <p>There is no requirement.</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed	Given during the course											
Work placement	Not applicable											