GDAŃSK UNIVERSITY OF TECHNOLOGY

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

<table>
<tr><td>Subject contents</td><td>1. Measurements in the laboratory of hydraulics and pneumatic systems for data collection and measurement.

2. Wear of the machinery components and monitoring of oil.

3. Preparation of the hydraulic system to operate.

4. Methods for determining of pressure losses in the internal channels of pump and hydraulic and pneumatic motor.

5. Determination of the theoretical displacement of hydraulic and pneumatic machine.

6. Methods of testing the motor and the pump at a constant low speed. Starting torque.

7. Methods of description of the losses in hydraulic and pneumatic motors.

8. Methods of testing of the hydraulic and pneumatic systemscomponents at low ambient temperatures.

9. Methodology of the testing of the seals in the reciprocating and rotary motion.

10. Methods of dewatering oil. Methods for determining the amount of water in oil.

11. Method of the thermal monitoring and diagnosis of hydraulic devices.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of hydraulics and pneumatics.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture</td><td>56.0%</td><td>75.0%</td></tr>
<tr><td>Laboratory</td><td>56.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. A. Osiecki, Hydrostatyczny napęd maszyn, WNT, W-wa 1998.

2. A. Balawender and others, Laboratorium napędów hydraulicznych. Part 1. Podstawy hydrauliki. Wyd. IMP PAN, Gdańsk 1996.

3. S. Stryczek, Napęd hydrostatyczny, volume I i II, WNT, W-wa 1997.</td></tr>
<tr><td>Supplementary literature</td><td>There is no requirement.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Given during the course</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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