GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Automation and modernization of devices, PG_00057878		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Technologii Maszyn i Automatyzacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Daniel Chuchała	
	Teachers		

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	0.0	0.0	30

Subject objectives: The aim of the course is to familiarise students with the basic options for upgrading equipment

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W08] He/she broad knowledge related to understand social, economic, legal, ecological and other outer techniques conditions of engineering activities in mechanical-medical engineering	The student has a basic knowledge of how the retrofitting of equipment affects the environment and society	[SW1] Assessment of factual knowledge
[K7_U09] He/she has skills to work in industrial environment and is aware of work safety rules	The student has basic knowledge in the safety of work with machinery and equipment	[SU2] Assessment of ability to analyse information
[K7_U05] He/she can use measurement technique and methods to assess errors of measurement. He/she can plan and conduct research (also numerical ones) and interprets obtained results and draw conclusions	The student has a basic knowledge of how to operate selected measuring equipment	[SU4] Assessment of ability to use methods and tools
[K7_W03] He/she knows methods, techniques and tools applied to solve engineering problems in the scope of the field of study of mechanical-medical engineering	Students can use statistical methods to analyse data	[SW1] Assessment of factual knowledge
[K7_U04] He/she can use programming-communicative techniques concerning to the scope of engineering tasks	The student has a basic knowledge of the selection of drive components	[SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>LECTURE:Angular and linear position measurement. Servo drives in feed units. Sensors for component condition diagnostics. Systems for tool monitoring and diagnostics. Systems for monitoring and diagnostics of the machining process. Mechatronic solutions integrated into machine tools.

LABORATORY:

Drive and control components of modern technological machines. Structural structure and operation of a CNC machine tool. Monitoring and diagnostics of the cutting tool. Accuracy of NC milling machine table positioning. Dynamic tests of technological machines. Positioning drives with stepper motors. Automatic drives of process machines with AC motors.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Final test</td><td>56.0%</td><td>90.0%</td></tr>
<tr><td>Laboratory exercises</td><td>100.0%</td><td>10.0%</td></tr>
</table>
</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Wrotny L.T: Podstawy konstrukcji obrabiarek i inne książki2. Skoczyński W. Sensory w obrabiarkach CNC. PWN 20183. Honczarenko J.: Obrabiarki sterowane numerycznie. WNT. 2009.4. Kosmol J.:Serwomechanizmy obrabiarek sterowanych numerycznie. WNT. Warszawa, 1998.</td></tr>
<tr><td>Supplementary literature</td><td>1. Honczarenko J.: Roboty przemysłowe, budowa i zastosowanie. WNT. 2010.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Methods of measuring and verifying the angular position of the spindle</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>