



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 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	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 Automatykacji 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_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		
	[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_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_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_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			

Subject contents	<p>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.</p> <p>LABORATORY:</p> <p>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.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory exercises	100.0%	10.0%
	Final test	56.0%	90.0%
Recommended reading	Basic literature	<p>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.</p>	
	Supplementary literature	1. Honczarenko J.: Roboty przemysłowe, budowa i zastosowanie. WNT. 2010.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Methods of measuring and verifying the angular position of the spindle		
Work placement	Not applicable		