



## Subject card

Subject name and code	, PG_00056112						
Field of study	Mechatronics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
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			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	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	Acquainting with the most commonly used types of drives of modern numerically controlled machines and their basic components. Understanding the effect of the type machine control system selection on the selection of drives.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] is able to elaborate on specific mechatronic topics as well as topics from engineering and technical sciences and disciplines such as Mechanical Engineering, Automation, Electronics and Electrical Engineering		Can select the basic components to design a machine tool drive		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_U05] is able to use properly choosen tools to compare design solutions of elements and mechatronics systems according to given application and economic crtierions (e.g. power demand, speed, costs)		Student is able to design a simple kinematics and its technical solution		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics course		Student knows the basic control systems of CNC machine tools, their possibilities and limitations		[SW1] Assessment of factual knowledge		
Subject contents	LECTURE:CNC machine tools with series and parallel connections in the system configuration. Basic control systems for commercial CNC machine tools. Drives of automated manufacturing machines. Evolution ofapplication electric, pneumatic and hydraulic drives. Specification of requirements that drives of modernmachine tools have to meet with. Classification, basic features and area of application of contemporarydrives with electric motors. Definition and structure of a servodrive. Direct drives. Examples of drives ofmodern manufacturing machines.PRACTICAL EXERCISES: Positioning accuracy of the table of the CNC milling machine. Design structure of numerical controlled machine tools. Dynamical investigations of the machine tools spindles. Positioning drives with stepping motors. Automated drives of manufacturing machines with AC motors.Power balance in manufacturing machines.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	56.0%	70.0%
	Laboratory	100.0%	30.0%
Recommended reading	Basic literature	1. Jemielniak K.: Automatyczna diagnostyka stanu narzędzia i procesu skrawania. Oficyna Wydawnicza Poli. Warsz. 2002.2. Kosmol J.: Serwonapędy obrabiarek sterowanych numerycznie. WNT1998.3. Honczarenko J.: Obrabiarki sterowane numerycznie. WNT Warszawa 2008	
	Supplementary literature	Grzesik W., Nlesłony P., Kiszka P.: Programowanie obrabiarek CNC. PWN Warszawa, 2020.	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	Final Test contains a number of specific questions with topic, i.e. classes, lectures and lab exercises		
Work placement	Not applicable		