



Subject card

Subject name and code	, PG_00056113						
Field of study	Mechatronics						
Date of commencement of studies	October 2024	Academic year of realisation of subject				2026/2027	
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Kazimierz Orłowski					
	Teachers						
Lesson types	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	Explanations of processes in mechanisms of machine tools, which affect their technical-operational features. The analyses of the structure, performance and maintenance of basic units and groups of machine tools. Joining knowledge from different domains.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
Subject contents	<p>Course content – lecture</p> <p>LECTURE: Technicaloperational features of machine tools: productivity, accuracy, stiffness, safety, ergonomics, durability and reliability. Basic units of modern machine tools. Requirements, properties and structure of bodies, guiding systems and spindle units. Analysis of athe kinematic system of a machine tool: concepts, kinematical couplings, kinematical accuracy. CNC machine tools with series and parallel connections in the system configuration. Drives of automated manufacturing machines. Evolution of application electric, pneumatic and hydraulic drives. Specification of requirements that drives of modern machine tools have to meet with. Classification, basic features and area of application of contemporary drives with electric motors. Definition and structure of a servodrive. Direct drives. Examples of drives of modern manufacturing machines.</p> <p>PRACTICAL EXERCISES: Kinematical accuracy of machine tools. Positioning accuracy of the table of the CNC miller. Dynamical investigations of machine tools. Design structure of numerical controlled machine tools. Positioning drives with stepping motors. Automated drives of manufacturing machines with AC motors. Power balance in manufacturing machines. Constructional structures of numerically controlled manufacturing machines.</p>						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Midterm colloquium		56.0%		70.0%		
	Practical exercises		100.0%		30.0%		
Recommended reading	Basic literature		Jemielniak K.: Automatyczna diagnostyka stanu narzędzia i procesu skrawania. Oficyna Wydawnicza Poli. Warsz. 2002. Kosmol J.: Serwonapędy obrabiarek sterowanych numerycznie. WNT1998. Honczarenko J.: Obrabiarki sterowane numerycznie. WNT Warszawa 2008				
	Supplementary literature		Grzesik W., Nlesłony P., Kiszka P.: Programowanie obrabiarek CNC. PWN Warszawa, 2020.				
	eResources addresses						
Example issues/ example questions/ tasks being completed	Final Test contains a number of specific questions with topic, i.e. classes. lectures and lab exercises						

Practical activities within the subject	Not applicable
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