

§ GDAŃSK UNIVERSITY § OF TECHNOLOGY

Subject card

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Subject name and code	Machine tools and cutting tools, PG_00054471								
Field of study	Mechanical Engineering								
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			Englis	n		
Semester of study	6		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	Subject supervisor		prof. dr hab. inż. Kazimierz Orłowski						
of lecturer (lecturers)	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	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 classes includ plan	n didactic led in study	Participation in consultation hours		Self-study SI		SUM	
	Number of study hours	30		0.0		0.0		30	
Subject objectives	Familiarize with the most common varieties of drives of modern numerically controlled machines Understand the most common types of drives of modern numerically controlled machines and their basic components. Extend knowledge of machine tool kinematics using the example of machine tools for hobbing of cylindrical wheels. Familiarize with the basic phenomena in machining processes. Familiarize with basic phenomena in machining processes, construction and principles of selection of modern cutting tools.								
Learning outcomes	Course outcome		Subject outcome				Method of ver	ification	
	K6_U08		Examines the influence of basic parameters of the cutting process on machining effects. Selects basic tools cutting tools and indexable cutting inserts			[SU3] Assessment of ability to use knowledge gained from the subject			
	K6_W12		Use of computer-aided tools selection and machining parameters.			[SW1] Assessment of factual knowledge			
	к6_U09		The student explains the processes occurring in machining. The student distinguishes and describes basic machining methods hobbing and shaping of toothed wheels			[SU3] Assessment of ability to use knowledge gained from the subject			
	K6_W11		Able to find his/her way around the machinery park area.			[SW1] Assessment of factual knowledge			

Subject contents	Structure and principle of operation of multi-axis machining centres. Typical mechanical components of modern drives. Modular drive units. Costs of machining process. Universal tooling used in CNC machining. General characteristics and classification of materials for blades of tools with a defined cutting edge. Causes of wear, geometric indicators of wear, physical and technological indicators of bluntness of the blade. Wear in time. Principles of blade material selection. Cutting forces, methods of their determination. Tool systems (ISO, HSK, CAPTO, etc.). Principles of selection of typical tools and cutting inserts. Kinematics of gear hobbing machine tools. Laboratories: Modular technological machines. Elements of control and drives of technological machines. Kinematic accuracy of hobbing milling machine for gears of cylindrical wheels (Pfauter hobbing machine). Effect of using Wiper geometry on surface roughness. Computer-aided selection of turning, milling or threading tools. Prediction of surface roughness of head milling operations. Selection of tools and machining parameters for drilling of holes on hull drill.					
Prerequisites and co-requisites						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	Lecture	56.0%	90.0%			
	Laboratory	100.0%	10.0%			
Recommended reading	 Basic literature Davim (editor): Machining Fundamentals and Recent Advances 2008 Springer-Verlag London Limited (DOI 10.1007/978-1-84800-213-5) GRZESIK Wit. Advanced Machining Processes of Metallic Materials. Theory, Modelling, and Applications. 2nd Edition, ELSEVIER, Amsterdam 2017 ASM Handbook, Volume 16, Machining. ASM International. Handbook Committee, 1989 					
	Supplementary literature	Childs, T., Maekawa, K., Obikawa, T., Yamane, Y Metal Machining. Theory and Applications. ARNOLD, London 2000 Training handbook. Metal cutting technology. C-2920:40 en-GB © AB Sandvik Coromant 2017.11				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	Analysis of the kinematic scheme of a selected hobbing machine tool. Selection of tools using computer programs.					
Work placement	Not applicable					