



## Subject card

Subject name and code	Material Removal Processes, PG_00040169						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			English		
Semester of study	2	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Manufacturing and Production Engineering -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Kazimierz Orłowski					
	Teachers	prof. dr hab. inż. Kazimierz Orłowski dr hab. inż. Daniel Chuchała dr inż. Agata Sommer					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						
	Material Removal Processes; W/L; DaPE; 1st grade, 2nd semester, Summer 22/23 (M:32002W0) - Moodle ID: 28575 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28575">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28575</a>						
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	45	7.0	48.0	100		
Subject objectives	Giving basic knowledge concerning manufacturing technologies with special consideration to cutting processes and machine tools.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_W03	Knows the basic types of tool materials and their application in machining processes			[SW1] Assessment of factual knowledge		
	K6_U04	Can select correct cutting process parameters using catalogues of cutting tools for a given set of workpiece material and cutting edge material.			[SU2] Assessment of ability to analyse information		
	K6_W08	Can select the correct machining process for the given type of element being manufactured			[SW1] Assessment of factual knowledge		
Subject contents	<p>LECTURE: Geometric and kinematic parameters of cutting. Movements of tools and workpieces during machining. Geometry of a cutting tool analysed in tool-in-hand system and in tool-in-use system. Geometry of cut. A phenomenon of chip formation and kinds of chips. Heat and temperature in cutting area. Coolant and lubricant agents. Wear of cutting tools. Force and power during machining. Vibrations during cutting. Tool materials and rules of their selection. Basic ways of cutting: turning, milling, drilling, deepening, boring. Abrasive machining. LABORATORY: Parting-off materials and machine-tools for cutting-off. Machining on lathes. Machining on drilling machines. Machining on milling machines. Machining of toothed gear-wheels. Machining on grinding machines. Cutting on planing machines and vertical shapers.</p>						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	56.0%	90.0%
	Laboratory	100.0%	10.0%
Recommended reading	Basic literature	<p>1. GRZESIK Wit. Advanced Machining Processes of Metallic Materials. Theory, Modelling, and Applications. 2nd Edition, ELSEVIER, Amsterdam 2017</p> <p>2. ASM Handbook, Volume 16, Machining. ASM International. Handbook Committee. 1989</p> <p>3. Childs, T., Maekawa, K., Obikawa, T., Yamane, Y.. Metal Machining. Theory and Applications. ARNOLD, London 2000</p>	
	Supplementary literature	1. Kalpakjian Serope, Schmid Steven. Manufacturing Engineering & Technology (7th Edition), Published by Pearson, 2014.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Final test consists of many questions that are related to all subsubjects.		
Work placement	Not applicable		