



Subject card

Subject name and code	Material Removal Processes, PG_00040169						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2023/2024		
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 inż. Aleksandra Suchta 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						
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_W08		Can select the correct machining process for the given type of element being manufactured		[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_W03		Knows the basic types of tool materials and their application in machining processes		[SW1] Assessment of factual knowledge		
Subject contents	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.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	100.0%	10.0%
	Written exam	56.0%	90.0%
Recommended reading	Basic literature	1. GRZESIK Wit. Advanced Machining Processes of Metallic Materials. Theory, Modelling, and Applications. 2nd Edition, ELSEVIER, Amsterdam 2017 2. ASM Handbook, Volume 16, Machining. ASM International. Handbook Committee. 1989 3. Childs, T., Maekawa, K., Obikawa, T., Yamane, Y.. Metal Machining. Theory and Applications. ARNOLD, London 2000	
	Supplementary literature	1. Kalpakjian Serope, Schmid Steven. Manufacturing Engineering & Technology (7th Edition), Published by Pearson, 2014.	
	eResources addresses	Adresy na platformie eNauczanie: Material Removal Processes; W/L; DaPE; 1st grade, 2nd semester, Summer 23/24 (M:32002W0) - Moodle ID: 36159 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=36159	
Example issues/ example questions/ tasks being completed	Final test consists of many questions that are related to all subsubjects.		
Work placement	Not applicable		