



Subject card

Subject name and code	Material Removal Processes, PG_00040169						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
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. Wojciech Błacharski dr inż. Aleksandra Suchta					
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 Adresy na platformie eNauczanie: Material Removal Processes; W/L; DaPE; 1st grade, 2th semester (M:32002W0): Summer 2021 - Moodle ID: 10121 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10121						
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	<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	<table border="1"> <thead> <tr> <th data-bbox="453 528 794 557">Subject passing criteria</th> <th data-bbox="794 528 1139 557">Passing threshold</th> <th data-bbox="1139 528 1490 557">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 562 794 591">Laboratory</td> <td data-bbox="794 562 1139 591">100.0%</td> <td data-bbox="1139 562 1490 591">30.0%</td> </tr> <tr> <td data-bbox="453 595 794 624">Written exam</td> <td data-bbox="794 595 1139 624">50.0%</td> <td data-bbox="1139 595 1490 624">70.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	100.0%	30.0%	Written exam	50.0%	70.0%
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Laboratory	100.0%	30.0%										
Written exam	50.0%	70.0%										
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	<p>1. Kalpakjian Serope, Schmid Steven. Manufacturing Engineering & Technology (7th Edition), Published by Pearson, 2014.</p>										
	eResources addresses	<p>Material Removal Processes; W/L; DaPE; 1st grade, 2th semester (M: 32002W0): Summer 2021 - Moodle ID: 10121 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=10121</p>										
Example issues/ example questions/ tasks being completed	Final test consists of many questions that are related to all subsubjects.											
Work placement	Not applicable											