



Subject card

Subject name and code		Material Removal Processes, PG_00039869						
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			Polish		
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		dr inż. Wojciech Blacharski				
		Teachers		dr inż. Wojciech Blacharski dr hab. inż. Daniel Chuchała 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						
		Obróbka Skrawaniem: W/L; MiBM 1 stopień, 2 semestr (M:31534W0): Lato 2021 - Moodle ID: 10122 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10122						
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	6.0		49.0		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] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	The student describes the basic methods of machining, their technological possibilities and applications.			[SW1] Assessment of factual knowledge		
		[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials	The student describes the properties of materials for cutting tool blades and the principles of their selection for machining tasks.			[SW1] Assessment of factual knowledge		
		[K6_U04] is able to perform a critical analysis of the existing technical solutions, present the specification of the technology of manufacturing basic construction elements of machines and engineering assemblies	Student characterizes physical phenomena during cutting processes and their influence on the course of machining.			[SU3] Assessment of ability to use knowledge gained from the subject		
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. Quality of the surface after machining. 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. Structure of abrasive tools: abrasive grains, bonds, principles of selecting grinding wheels. Wear processes and ways of dressing the grinding wheels. 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	Basic knowledge of machinery and machine parts, materials and strength of materials.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final test	50.0%	90.0%
	Laboratory exercises	100.0%	10.0%
Recommended reading	Basic literature	Olszak W. Obróbka skrawaniem. WNT Warszawa 2008. Grzesik W.: Podstawy skrawania materiałów metalowych. WNT warszawa 1998. Jemielniak K.: Obróbka skrawaniem. Ofic. Wyd. Polit. Warsz. Warszawa 1998. Cichosz P.: Narzędzia skrawające. WNT, Warszawa 2006. Bartosiewicz J.: Obróbka skrawaniem i elementy obrabiarek. Wyd. Poilt. Gda. Gdańsk 1997.	
	Supplementary literature	Internet - selected web pages of manufacturers of cutting tools.	
	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		