



Subject card

Subject name and code	Machining and processing of plastics, PG_00033428						
Field of study	Medical and Mechanical Engineering, Mechanical and Medical Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2021/2022		
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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
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. Sławomir Szymański dr hab. inż. Daniel Chuchala				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: Obróbka Skrawaniem i Przetwórstwo Tworzyw Sztucznych - W/L; IMM, I stopień, 3 semestr: (M:31401W0): Zima 2021 - Moodle ID: 16436 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16436						
	Additional information: lectures are conducted at webinars,own recordings, presentations, films, demonstrations, exercise files						
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	30		5.0		15.0	50
Subject objectives	Preparation for recognizing machining processes						
	Acquiring knowledge in the field of polymer materials processing methods						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W10		The student has knowledge of the machining processes The student has knowledge of the methods of manufacturing polymer products		[SW1] Assessment of factual knowledge		
	K6_U07		The student is able to choose the machine tool and tools for a given case The student is able to select the technological process for typical plastic products		[SU3] Assessment of ability to use knowledge gained from the subject		

Subject contents	<p>LECTURE Geometric and kinematic quantities of cutting. Tool and workpiece movements, blade geometry in the tool layout, cut layer geometry. Effect of the tool nose on workpiece material. Chip formation. Forces and cutting forces. Tool materials and general rules for themselection. Basic methods of machining: turning, drilling, countersinking, reaming, milling.Grinding, surface grinding. Plastics processing - Basic concepts -definitions. Molding of plastic products.Physico-chemical processing, methods (injection molding, block pressing, stamping, welding, welding). Chemical and physical processing polymers, methods (gluing, metallization).</p> <p>LABORATORY TRAINING On lathes. Machining on milling machines. Machining of gears. Machining on grinders. High-pressure moulding of plastics: moulding thermosetting plastics solid pressing method, moulding of thermoplastics by injection moulding and extrusion. (application, machine and tool construction, technology, parameters) Joining of plastic elements using the following methods: impulse welding, hot welding air, ultrasonic welding (application, equipment construction, technology, parameters) , bonding of plastics .</p>		
Prerequisites and co-requisites	finished materials science		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	60.0%	70.0%
	reports	100.0%	30.0%
Recommended reading	Basic literature	1. Olszak W.: Obróbka skrawaniem. WNT, 2008.	
		2. Grzesik W.:Podstawy skrawania materiałów metalowych. WNT.1998.	
		3. Jemielniak K.: Obróbka skrawaniem. Oficyna Wyd. Polit. Warsz. Warszawwa 1998.	
		4. Poradnik Inżyniera Mechanika : Obróbka skrawaniem.	
		5.Sikora R.: Przetwórstwo tworzyw wielkocząsteczkowych, PWNWarszawa, 1994.	
	Supplementary literature	1. Poradnik obróbki skrawaniem, Sanndvik Coromant. 2010	
		2. Cichosz P. Narzędzia skrawające, WNT 2006	
	eResources addresses	Obróbka Skrawaniem i Przetwórstwo Tworzyw Sztucznych - W/L; IMM, I stopień, 3 semestr: (M:31401W0): Zima 2021 - Moodle ID: 16436 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16436	
Example issues/ example questions/ tasks being completed	Methods of making axially symmetrical and prismatic parts.		
	Tool materials		
	Polymer processing methods		
Work placement	Not applicable		