



## Subject card

Subject name and code	Machining and processing of plastics, PG_00033428						
Field of study	Mechatronics, Mechatronics						
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 inż. Wojciech Blacharski					
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						
	Obróbka Skrawaniem i Przetwórstwo Tworzyw Sztucznych - W/L; Mechatronika, I stopień, 3 semestr: (M: 31401W0): Zima 2021 - Moodle ID: 16437 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16437">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=16437</a>						
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_W08	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_U01	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 their selection. 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	basic knowledge of materials science											
Assessment methods and criteria	<table border="1" data-bbox="448 555 1490 589"> <thead> <tr> <th data-bbox="448 555 798 589">Subject passing criteria</th> <th data-bbox="798 555 1141 589">Passing threshold</th> <th data-bbox="1141 555 1490 589">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 589 798 622">75</td> <td data-bbox="798 589 1141 622">60.0%</td> <td data-bbox="1141 589 1490 622">75.0%</td> </tr> <tr> <td data-bbox="448 622 798 656">25</td> <td data-bbox="798 622 1141 656">100.0%</td> <td data-bbox="1141 622 1490 656">25.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	75	60.0%	75.0%	25	100.0%	25.0%
	Subject passing criteria	Passing threshold	Percentage of the final grade									
	75	60.0%	75.0%									
25	100.0%	25.0%										
75	60.0%	75.0%										
25	100.0%	25.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Olszak W.: Obróbka skrawaniem. WNT, 2008.</li> <li>2. Grzesik W.: Podstawy skrawania materiałów metalowych. WNT. 1998.</li> <li>3. Jemielniak K.: Obróbka skrawaniem. Oficyna Wyd. Polit. Warsz. Warszawa, 1998.</li> <li>4. Poradnik Inżyniera Mechanika : Obróbka skrawaniem.</li> <li>5. Sikora R.: Przetwórstwo tworzyw wielkocząsteczkowych, PWN, Warszawa, 1994.</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Poradnik obróbki skrawaniem, Sandvik Coromant. 2010</li> <li>2. Cichosz P. Narzędzia skrawające, WNT 2006</li> </ol>										
	eResources addresses											
Example issues/ example questions/ tasks being completed	<p>Methods of making axially symmetrical and prismatic parts.</p> <p>Tool materials</p> <p>Polymer processing methods</p>											
Work placement	Not applicable											