



## Subject card

Subject name and code	Manufacturing Engineering, PG_00050286						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
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	3		Language of instruction		English		
Semester of study	5		ECTS credits		6.0		
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 hab. inż. Mariusz Deja				
	Teachers		dr hab. inż. Mariusz Deja  dr inż. Dawid Zieliński  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	15.0	0.0	60
	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	60		6.0		84.0	150
Subject objectives	Acquainting with basic manufacturing techniques in terms of technological effects and properties of the workpiece surface layer. Analysis of manufacturing costs, designing the technological process.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U09		Selection of the manufacturing process and appropriate machining parameters for parts with specific design and technological requirements; selection of technological equipment		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	K6_W11		Process selection with the analysis of the obtained experimental results related to the achieved technological effects; selection of metrological devices		[SW3] Assessment of knowledge contained in written work and projects		
	K6_W06		Is oriented in the construction of CNC machine tools, knows the basic machine tool control systems		[SW3] Assessment of knowledge contained in written work and projects		
	K6_U08		Design of the technological process for typical mechanical components		[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		
	K6_U04		Variant analysis of the technological process		[SU2] Assessment of ability to analyse information		
Subject contents	Basic design and technological requirements. Manufacturing processes, fundamentals of cutting. Advanced machine tools, CNC centers. Technological stages and the cost of production. Sequence of operations for typical mechanical components. Abrasive machining and finishing operations. Innovations in Abrasive Products for Precision Grinding. Bio-design and bio-machining. Electrical discharge machining. Comparison between additive and subtractive technologies. Analysis of the manufacturing costs. Tools for the quality control. Measurement techniques.						

Prerequisites and co-requisites	Material removal processes, machine tools and tools. Technical drawing.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	35.0%
	Laboratory	60.0%	35.0%
	Exam	60.0%	30.0%
Recommended reading	Basic literature	1. Rufe, Philip D. <i>Fundamentals of manufacturing</i> . Society of Manufacturing Engineers, 2013. 2. Chryssolouris, G. (2013). <i>Manufacturing systems: theory and practice</i> . Springer Science & Business Media.	
	Supplementary literature	Selected papers from the journals available on-line:  1. Journal of Manufacturing Processes. 2. Journal of Manufacturing Systems. 3. CIRP ANNALS - Manufacturing Technology.	
	eResources addresses	Adresy na platformie eNauczanie: Manufacturing Engineering, 2022/2023, s. zimowy, DaPE, s. 5 - Moodle ID: 26275 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=26275">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=26275</a>	
Example issues/ example questions/ tasks being completed	1. Selected manufacturing processes for a given part with specific design and technological requirements. 2. Basic rules for selecting technological parameters for milling operations. 3. Basic rules for selecting technological parameters for turning operations. 4. The structure of a grinding wheel. 5. Influence of the manufacturing technique on the properties of the surface layer.		
Work placement	Not applicable		