



Subject card

Subject name and code		Fundamentals of Manufacturing Technology, PG_00055382						
Field of study		Mechanical Engineering						
Date of commencement of studies		October 2022	Academic year of realisation of subject			2023/2024		
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			4.0		
Learning profile		general academic profile	Assessment form			exam		
Conducting unit		Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)		Subject supervisor		dr hab. inż. Daniel Chuchała				
		Teachers		dr hab. inż. Daniel Chuchała mgr inż. Adrian Wolski dr inż. Grzegorz Gajowiec dr inż. Michał Landowski dr inż. Sławomir Szymański prof. dr hab. inż. Kazimierz Orłowski				
Lesson types and methods of instruction		Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
		Number of study hours	30.0	0.0	30.0	0.0	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	4.0		36.0		100
Subject objectives		Preparation for recognizing the processes of manufacturing mechanical elements						
Learning outcomes		Course outcome	Subject outcome			Method of verification		
		[K6_U09] is able to plan the manufacturing, assembly and quality control processes of typical constructions and mechanical devices, estimating their costs	The student is able to select the correct parameters of the cutting process with the use of tool catalogs, also in on-line versions, for a given set of workpiece material and cutting edge material			[SU4] Assessment of ability to use methods and tools		
		[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	The student is able to determine the necessary manufacturing processes to produce a given mechanical element			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
		[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments	The student is able to choose the correct production process, technological machine and the type of tools for the implementation of the production process of a given element.			[SW1] Assessment of factual knowledge		
		[K6_U08] is able to design a technological manufacturing process for typical elements of machines or devices, using analytical and numerical calculating tools	The student is able to use on-line tools to select machining parameters, as well as to calculate the shortening of sheets during the bending process on press brakes.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		

Subject contents	<p>LECTURE Geometric and kinematic parameters of cutting. Tool and workpiece movements. The geometry of the blades in the tool and working system, the geometry of the cut layer. The phenomenon of formation of chips and types of chips. Heat and temperature in the cutting zone. Cooling and lubricating agents. Wear of cutting tools. Cutting force and power. Tool materials and rules for their selection. Basic methods of machining: turning, milling, drilling, countersinking, reaming. Molding - Metallurgy metals and their alloys. Casting manufacturing methods. Special methods of making molds and cores. Special casting methods. Plastic Working - Basics of plastic working. Plastic deformation of metals. The influence of plastic deformation on the properties of metals. Classification of plastic working processes. Metal rolling. Forging and pressing. Pulling and extrusion. Technology for pulling bars, wires and pipes. Technology of extrusion processes. Punching of non-unfolding coatings. Metal cutting. Metal bending. Multiple and simultaneous pressing.</p> <p>LABORATORY Cutting materials and cutting-off machines. Machining on lathes. Machining on drills. Machining on milling machines. Machining of gears. Machining on grinders. Machining on planers and slotters. Preparation of the production of castings. Making forms using the split and non-split model. Plastic working machines. Influence of crushing on the mechanical properties of metals. Rolling. Plastic bending of profiles and pipes. Punching of non-unfolding coatings.</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 710 794 745">Subject passing criteria</th> <th data-bbox="794 710 1139 745">Passing threshold</th> <th data-bbox="1139 710 1489 745">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 745 794 781">Laboratory</td> <td data-bbox="794 745 1139 781">100.0%</td> <td data-bbox="1139 745 1489 781">30.0%</td> </tr> <tr> <td data-bbox="453 781 794 815">Lecture</td> <td data-bbox="794 781 1139 815">56.0%</td> <td data-bbox="1139 781 1489 815">70.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory	100.0%	30.0%	Lecture	56.0%	70.0%
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Laboratory	100.0%	30.0%										
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Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Olszak W. Obróbka skrawaniem. WNT Warszawa 2008. 2. Podręcznik szkoleniowy. Obróbka metali skrawaniem . Sandvik Coromant 2017. 3. Storch B.: Podstawy obróbki skrawaniem. Wyd. Politechniki Koszalińskiej, Koszalin 2001. 4. Cichosz P.: Narzędzia skrawające. WNT, Warszawa 2006. 5. Bartosiewicz J.: Obróbka skrawaniem i elementy obrabiarek. Wyd. Politechniki Gdańskiej, Gdańsk 1997 6. Szweyca M., Nadolska D.: Metalurgia i odlewnictwo. Poznań: Wyd. Politechniki Poznańskiej 7. Kosowski A.: Zarys odlewnictwa. Wyd. AGH Kraków 8. Skoblik R., Wilczewski L.: Technologia Metali. Laboratorium. 										
	Supplementary literature	<ol style="list-style-type: none"> 1. Jemielniak K.: Obróbka skrawaniem. Ofic. Wyd. Politechniki Warsz. Warszawa 1998. 2. Grzesik W.: Podstawy skrawania materiałów metalowych. WNT Warszawa 1998. 3. Materiały pomocnicze dostępne na stronach producentów narzędzi np. Seco Tools i in4. 4. Murza-Mucha K.: Techniki wytwarzania. Odlewnictwo. PWN Warszawa 5. 5. Dobrucki W.: Zarys obróbki plastycznej metali. Śląsk 										
	eResources addresses											
Example issues/ example questions/ tasks being completed	The final test contains many questions relating to the topics throughout the subject.											
Work placement	Not applicable											