



Subject card

Subject name and code	Computer Aided Design of Technological Processes, PG_00055503						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Optional subject group 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		Polish		
Semester of study	6		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		prof. dr hab. inż. Mariusz Deja				
	Teachers		dr inż. Dawid Zieliński				
			mgr inż. Karolina Chodnicka-Wszelak				
			prof. dr hab. inż. Mariusz Deja				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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		4.0		36.0	100
Subject objectives	A student designs technological processes of typical machine parts using CAD and CAM systems. Selectsa system to support manufacturing depending on the needs and capabilities of the production plant.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U08] is able to design a technological manufacturing process for typical elements of machines or devices, using analytical and numerical calculating tools		The selection of the manufacturing process plan depending on the class, type of parts, material, and dimensional and shape requirements.		[SU1] Assessment of task fulfilment		
	[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		Ability to use computer software for supporting manufacturing processes, design and selection of technological parameters.		[SW3] Assessment of knowledge contained in written work and projects		
	[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		Comparison of various manufacturing techniques, including subtractive and additive technologies, with an indication of their advantages and disadvantages.		[SU2] Assessment of ability to analyse information		

Subject contents	<p>LECTURE Production process and its components supported by computer systems. Data for the technological design process, documentation and technical time standard. Selection of machining allowances. Design of semi-finished products. Technology of construction. Machining bases and principles of setting workpieces on machine tools and machining accuracy. Technological methods of shaping the surface layer of machine parts and their impact on operational properties. Technological processes of typical machine parts for various types and degrees of automation of processing and assembly. Process typification. Group processing. Flexible manufacturing systems. LABORATORY Selection of semi-finished products and machining bases in the CAM system. Determining the technical standard for processing time in the CAM system. Selection and programming of machining depending on dimensional and shape accuracy. Selection of technology for axially symmetric and prismatic parts. Programming and machining on CNC machines. PROJECT Designs of technological processes of typical machine parts: e.g. shaft and prismatic components using the CAM system. Preparation of documentation, selection of: allowances, tooling, tools, technological parameters, determination of the technical time standard based on simulation of the machining process.</p>		
Prerequisites and co-requisites	Manufacturing technology, basics of machining, Computer Aided Design CAD and Computer Aided Manufacturing CAM		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Activity during classes	80.0%	20.0%
	Completing tasks during laboratories	60.0%	20.0%
	Projects	60.0%	20.0%
	Exam	60.0%	40.0%
Recommended reading	<p>Basic literature</p> <ol style="list-style-type: none"> 1. Feld M.: Podstawy projektowania procesów technologicznych typowych części maszyn. WNT, Warszawa, 2013. 2. Gawlik E. i inni: Procesów technologicznych obróbki skrawaniem. Wydawnictwa AGH, Kraków 2019. 3. Poradnik inżyniera. Obróbka skrawaniem. T. I-III. WNT, Warszawa, 1993. 4. Przemysław Kochan. EdgeCAM. Wieloosiowe frezowanie CNC. Wydawnictwo Helion. Gliwice 2014. 5. Grzesik W., Niesłony P., Bartoszek M.: Programowanie obrabiarek NC/CNC. WNT, Warszawa 2016. 6. Przybylski W., Deja M.: Komputerowo wspomagane wytwarzanie maszyn. Podstawy i zastosowanie. WNT, Warszawa 2007. 7. Augustyn K.: EdgeCAM. Komputerowe wspomaganie wytwarzania. Wydanie II. Helion, Gliwice 2006. 		
	Supplementary literature	1. Grzesik, W. Advanced machining processes of metallic materials: theory, modelling and applications. Elsevier, 2016.	
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Komputerowo wspomagane projektowanie procesów technologicznych (PG_00055503), MiBM s. 6, 2024_25 lato - Moodle ID: 45517 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=45517</p>	

<p>Example issues/ example questions/ tasks being completed</p>	<ol style="list-style-type: none"> 1. Selected production processes for parts of a specific class type, with specific design and technological requirements. 2. Basic principles of selecting technological parameters for technological operations. 3. The influence of manufacturing technique on the properties of the surface layer. 4. Technical standard of working time. 5. Methods of generating CNC programs for controlling technological devices.
<p>Work placement</p>	<p>Not applicable</p>

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