GDAŃSK UNIVERSITY OF TECHNOLOGY

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	dr hab. inż. Mariusz Deja
	Teachers	

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	
	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.

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	Basic literature	
		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., Bartoszuk 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	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	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.
Work placement	Not applicable