GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058717					
Field of study	Materials Engineering, Materials Engineering					
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025	
Education level	second-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	1		Language of instruction		Polish	
Semester of study	2		ECTS credits		2.0	
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. Stefan Dzionk				
	Teachers					

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						

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	Acquainting students with the methods of creating CAD documentation from a real object, i.e. reverse engineering, as well as methods of obtaining measurement data and methods of their processing.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U04	Student analyzes components scanned by reverse engineering methods. the student prepares a metrological report for elements scanned using reverse engineering methods.	[SU4] Assessment of ability to use methods and tools
	K7_U01	The student acquires information in the field of reverse engineering from domestic and foreign literature. The student verifies and interprets the data obtained from the literature.	[SU2] Assessment of ability to analyse information
	K7_W04	The student knows the basic scanning methods used in reverse engineering methods. The student evaluates the errors in the data obtained by the reverse engineering method.	[SW1] Assessment of factual knowledge
	K7_W05	The student selects the methods of data acquisition in reverse engineering systems according to the needs resulting from the accuracy of scanning. The student knows the basic methods of noise elimination from reverse engineering data.	[SW1] Assessment of factual knowledge

Subject contents	LECTURE: Reverse engineering, methods of mapping a real model into a virtual model. Surface scanning methods, creating data clouds, defining surfaces. Data formats used in reverse engineering, data conversion and conversion errors. Creation of CAD models based on data obtained from computed tomography and magnetic resonance techniques.
	LABORATORY: Creating a CAD model in *.stl format with different resolution. Surface scanning by various methods. raw data processing. Comparing the scanned elements with the CAD model. Point cloud CAD modeling.

Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	60.0%	50.0%
Practical exercise	60.0%	50.0%

Recommended reading	Basic literature	1. Chlebus E.: Innowacyjne technologie Rapie Prototyping/ Rapie Tooling w rozwoju produktu, Oficyna Wydawnicz Politechniki Wrocławskiej, Wrocław 2003
		2. Chlebus E.: Techniki komputerowe CAx w inżynierii produkcji, Warszawa WNT 2000
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Reverse engineering - the objectives and application. List and describe the methods of digitization. Methods of combining "point clouds" and verify the measurements for determining the area. Characterize the method of recording data in the format *. stl. List and describe the typical CAD model conversion errors * .stl format., The use of Euler's formula.

Work placement	Not applicable