



Subject card

Subject name and code	, PG_00058717						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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_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		
	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_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_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		
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
	Practical exercise	60.0%	50.0%
	Midterm colloquium	60.0%	50.0%
Recommended reading	Basic literature	1. Chlebus E.: Innowacyjne technologie Rapie Prototyping/ Rapie Tooling w rozwoju produktu, Oficyna Wydawniczej 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	<ol style="list-style-type: none"> 1. Reverse engineering - the objectives and application. 2. List and describe the methods of digitization. 3. Methods of combining "point clouds" and verify the measurements for determining the area. 4. Characterize the method of recording data in the format *. stl. 5. List and describe the typical CAD model conversion errors * .stl format., The use of Euler's formula. 		
Work placement	Not applicable		