



## Subject card

Subject name and code	, PG_00061828						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group				
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		assessment		
Conducting unit	Zakład Technologii Biomateriałów -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Bartmański				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		0.0		0.0	45
Subject objectives	The purpose of the course is to familiarize students with the basics of using 3D printing technology with composite materials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_K01] is aware of the need to expand knowledge and verify the methods of solving problems by consulting experts		The student is able to propose the right material for 3D printing.		[SK2] Assessment of progress of work		
	[K7_K02] is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions made demonstrates knowledge of actions to reduce risk and anticipate the social impact of engineering and manufacturing activities		The student is able to assess the risks associated with the use of 3D printing technology, including the impact on the environment.		[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice.		The student knows the principles of 3D printer for printing polymer, ceramic and composite materials.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_U01] can obtain information from literature, databases and others sources, also in English or another foreign language recognized as the language of international communication in a given engineering discipline; is able to integrate the obtained information, interpret it, as well as draw conclusions and formulate and justify opinions.		The student is able, based on available literature sources, to select the appropriate type of 3D printer for the material used for printing.		[SU2] Assessment of ability to analyse information		

Subject contents	1. Basics of 3D printing2. application areas of 3D printing.3. Quality control of 3D printing.4. Types of printers and other devices for 3D creation.5. Types of 3D technology.6. Use of 3D technology to print composite materials.7. Preparation and processing of models for 3D printing of composite materials.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory report	56.0%	40.0%
	Colloquium	56.0%	60.0%
Recommended reading	Basic literature	Budzik G., Druk 3d jako element przemysłu przyszłości analiza rynku i tendencje rozwoju, ISBN 978-83-7934-610-3 Richard Horne i Kalani Kirk Hausman, Druk 3D dla początkujących (wydanie drugie)	
	Supplementary literature	English-language scientific publications in 3D printing of composite materials.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1 What is 3D printing.2. What are the application areas of 3D printing?3. Types of printers and other devices for 3D creation.4. Types of 3D printing technologies.5. Areas of application of 3D printing of composite materials in industry.		
Work placement	Not applicable		