



## Subject card

Subject name and code	Advanced materials technologies , PG_00058895						
Field of study	Mechanical 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			English		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Materiałów Funkcjonalnych -> 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. Dionizy Czekaj				
	Teachers		prof. dr hab. inż. Dionizy Czekaj				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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	To explain students key issues in the field of Materials Science and Materials Engineering						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U01] is able to acquire information from specialist literary sources and other sources regarding the construction and operation of machines and related disciplines in polish and in a foreign language, is able to conduct a self-learning process, is able to synthesize the information, form conclusions and justify opinions		The student is able to use scientific databases, retrieve relevant information and critically analyze their suitability for the implementation of a selected engineering problem. The student understands the need to improve professional competences.		[SU2] Assessment of ability to analyse information		
	[K7_W06] possesses organized, profound knowledge necessary for designing and optimization of complex technological processes, modelling and calculations using numerical methods, knows modern manufacturing methods and tools for designing manufacturing processes of machines, devices, their elements and components		The student has the knowledge necessary to design complex technological processes, knows modern methods of manufacturing engineering materials		[SW1] Assessment of factual knowledge		
	[K7_W11] possesses organized knowledge useful in understanding ex-technical conditioning connected with performing the profession of an engineer and taking it into consideration in engineering practice; possesses well-established knowledge within the range of intellectual property, management and organization of manufacturing processes, including the management and life-cycle of a product		The student has knowledge useful to understand non-technical conditions related to the profession of an engineer.		[SW1] Assessment of factual knowledge		

Subject contents	1. Introduction to Materials and Processes in Manufacturing 2. Properties of Materials 3. Material Selection 4. Nontraditional Manufacturing Processes 5. Micro/Meso/Nano Fabrication Processes		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project Report	100.0%	50.0%
	Colloquium (written paper)	51.0%	50.0%
Recommended reading	Basic literature	1. W.D. Callister, Jr., Materials Science And Engineering, An Introduction, 7th ed., Wiley, 2007, ISBN 0-471-73696-1. 2. M.F. Ashby, Materials selection in mechanical design, 4th ed., Elsevier Ltd., 2011 3. M.P. Groover, Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 5th Edition, John Wiley & Sons, Inc., Hoboken, NJ, 2013 4. J.T. Black, R.A. Kohser, DeGarmo MATERIALS AND PROCESSES IN MANUFACTURING ELEVENTH EDITION, John Wiley & Sons, Inc., Hoboken, NJ, 2012	
	Supplementary literature	1. M. Blicharski., Wstęp do inżynierii materiałowej, Wydawnictwo Naukowo Techniczne, Warszawa 2001 2. M. Blicharski, Inżynieria materiałowa, Wydawnictwo Naukowo Techniczne, Warszawa 2014; 3. M. Blicharski, Inżynieria powierzchni, Wydawnictwo Naukowo Techniczne, Warszawa 2019; 4. M. Kaczorowski, A. Krzyńska, Konstrukcyjne materiały metalowe, ceramiczne i kompozytowe, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2017 5. L.A. Dobrzański , Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie z podstawami projektowania materiałowego., WNT Warszawa, 2002 6. M. Ashby, H. Shercliff, D. Cebon, Inżynieria materiałowa, T1, T2, Wydawnictwo Galaktyka, Łódź, 2011	
	eResources addresses	Adresy na platformie eNauczenie: Advanced Materials Technologies, W, IDE, sem.03, letni 23/24 - Moodle ID: 37029 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37029">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37029</a> Advanced Materials Technologies, W, IDE, sem.03, letni 23/24 - Moodle ID: 37029 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37029">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=37029</a>	
Example issues/ example questions/ tasks being completed	1. Properties of advanced ceramic materials 2. Technology of advanced ceramics 3. Fundamentals of material selection		
Work placement	Not applicable		