



## Subject card

Subject name and code	Materials engineering methods in science and technology, PG_00028062						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group				
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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład ceramiki -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Aleksandra Mielewczyk-Gryń				
	Teachers		Daniel Jaworski  dr hab. inż. Aleksandra Mielewczyk-Gryń				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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		0.0		0.0	30
Subject objectives	The aim of a class is to present students the different applications of nanotechnology methods e.g. history or biology.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W08		has basic knowledge of development trends in the use of materials engineering methods in other fields of science and technology		[SW1] Assessment of factual knowledge		
	K6_U06		Is able to integrate the obtained information on the methods of materials engineering, interpret them, and draw conclusions as well as formulate and justify opinions		[SU2] Assessment of ability to analyse information		
	K6_U09		has the ability to prepare oral presentations in Polish with the use of available tools and the knowledge of theoretical concepts		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	<ul style="list-style-type: none"><li>• Calorimetry</li><li>• Microscopy</li><li>• Resonance methods</li><li>• Spectroscopic methods</li><li>• Ion scattering methods</li><li>• Electrochemical methods</li></ul>						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	51.0%	50.0%
	Essay	51.0%	50.0%
Recommended reading	Basic literature	Experimental Methods in the Physical Sciences	
	Supplementary literature	scientific papers eg:  <a href="#">J Biomol Tech</a> . 2010 Dec; 21(4): 167193.  Hyperfine Interactions 154: 159176, 2004  <a href="#">Proc Natl Acad Sci U S A</a> . 2013 Apr 23; 110(17): 66516656	
	eResources addresses	Adresy na platformie eNauczanie: Metody inżynierii materiałowej w innych dziedzinach nauki i techniki - Moodle ID: 37145 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37145">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37145</a>	
Example issues/ example questions/ tasks being completed	- Proteins denaturation analysis.  - Microscopy in archeology.  - photoelectric effect and it's applications		
Work placement	Not applicable		