



## Subject card

Subject name and code	, PG_00058704						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
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	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Elektrochemii i Fizykochemii Powierzchni -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Natalia Wójcik				
	Teachers		dr hab. inż. Natalia Wójcik				
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						
Szkła specjalne - Moodle ID: 29069 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29069">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29069</a>							
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	Learning about modern amorphous materials and technological issues related to their application.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W03		The student knows the theoretical basis of the science of amorphous materials. The student knows the basic applications of modern amorphous materials and glassy composites.		[SW1] Assessment of factual knowledge		
	K7_U03		The student independently designs the synthesis of amorphous materials for special applications, prepares them and tests their properties using laboratory equipment.		[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
Subject contents	<ul style="list-style-type: none"> <li>Special properties of glass materials.</li> <li>Special glasses and glass-ceramic composites: bioglass, oxynitride glass, ferroelectrics, ferromagnetics, multiferroics, spin glasses, non-linear materials</li> </ul>						
Prerequisites and co-requisites	Basic knowledge of glass production and properties required.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	laboratory		50.0%		30.0%		
	assignment and presentation		50.0%		70.0%		
Recommended reading	Basic literature		<ul style="list-style-type: none"> <li>Introduction to Glass Science and Technology, James E. Shelby, The Royal Society of Chemistry 2005</li> <li>Materials Science and Technology Glasses and Amorphous Materials, Vol. 9, Volume Editor J. Zarzycki</li> </ul>				
	Supplementary literature		N/A				

	eResources addresses	
Example issues/ example questions/ tasks being completed	1. What is bioglass and what properties should it have? 2. Where are bioglasses used?	
Work placement	Not applicable	