GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00063689		
Field of study	Nanotechnology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study 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	English
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division Of Electrochemistry And Surface Physical Chemistry -> Institute Of Nanotechnology And Materials Engineering -> Faculty Of Applied Physics And Mathematics -> Wydziały Politechniki Gdańskiej		
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	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	5.0	25.0	75

Subject objectives

Learning about modern amorphous materials and technological issues related to their synthesis and application.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U07] can apply the obtained specialist knowledge to the problems within exact sciences, natural or technical sciences.	The student knows the theoretical basis of the science of amorphous materials.	[SU2] Assessment of ability to analyse information
[K7_W01] has extended and organized knowledge of materials science.	The student knows the theoretical basis of the science of amorphous materials. The student proposes the basic methods of testing the properties of amorphous materials.	[SW1] Assessment of factual knowledge
[K7_U01] can learn individually, obtain knowledge and integrate information from literature, databases and other properly selected sources (in Polish and English). Has the ability of critical analysis and selection of information.	The student prepares a presentation on modern amorphous materials and their applications.	[SU1] Assessment of task fulfilment
[K7_W03] has general knowledge on current development directions and discoveries in physics, chemistry, technology and applications of nanostructures.	The student knows the basic applications of modern amorphous materials and glass nanocomposites.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>

- Glass around us
- Preparation, conditions
- Manufacturing methods
- Basic properties of glasses: electrical, thermal, mechanical, optical
- Special glasses and glass-ceramic composites: bioglass, oxynitride glass, ferroelectrics, ferromagnetics, multiferroics, spin glasses, non-linear materials
- Nanostructures in glass

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<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>assignment and presentation</td><td>50.0%</td><td>70.0%</td></tr>
<tr><td>laboratory</td><td>50.0%</td><td>30.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>

- Introduction to Glass Science and Technology, James E. Shelby, The Royal Society of Chemistry 2005
- Materials Science and Technology Glasses and Amorphous Materials, Vol. 9, Volume Editor J. Zarzycki

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<tr><td>Supplementary literature</td><td>N/A</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>

1. What is bioglass and what properties should it have?
2. Where are bioglasses used?

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<tr><td>Work placement</td><td>Not applicable</td></tr>
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