GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Glasses and amorphous materials, PG_00039754		
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	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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład fizyki nanomateriałów -> Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Leszek Wicikowski	
	Teachers	dr inż. Leszek Wicikowski	

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	1.0	19.0	50

Subject objectives

The main aim is to present the fundamental of the glassy state including structure, methods of preparation and application of glassy materials

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W07	The student uses theoretical knowledge about glasses and amorphous materials freely. Can define the methods of their production and research methods used to characterize these materials	[SW2] Assessment of knowledge contained in presentation
K6_U07	The student is able to prepare a seminar presentation based on the latest foreign-language scientific articles. Follows the latest achievements in materials engineering regarding amorphous materials	[SU5] Assessment of ability to present the results of task
K6_K01	Based on scientific papers, the student can prepare a written article on a given topic regarding nanostructural modifications of glasses and amorphous materials. The student can critically evaluate information. He can use the literature and knowledge of experts	[SK5] Assessment of ability to solve problems that arise in practice
K6_U09	The student prepares a seminar on a given topic using the latest scientific reports	[SU2] Assessment of ability to analyse information

Subject contents

Glassy state of matter. Glass transition. Viscisity.Glass formation criteria. Random network. Radial distribution function. Glassforming oxides and modificators. Structure of glass.Classification of inorganic oxide glasses. Crystallization processes and phase separation in glasses. Glass-ceramics Glass technology. Typical silicate, borate, phosphate and tellurite systems.

Prerequisites and co-requisites

Fundamental knowledge in physics and chemistry

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Seminar</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Colloquim</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>R. H. Doremus Glass Science, Wiley 1973

J.E. Shelby, Introduction the glass science and technology, RSC 2005</td></tr>
<tr><td>Supplementary literature</td><td>Additional materials (electronic version) from lecturer</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Szkła i Materiały Amorficzne - Moodle ID: 34629
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34629</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Glassy state of matter. Glass transition. Viscisity.Glass formation criteria. Random network. Radial distribution function. Glassforming oxides and modificators. Structure of glass.Classification of inorganic oxide glasses. Crystallization processes and phase separation in glasses. Glass-ceramics Glass technology. Typical silicate, borate, phosphate and tellurite systems</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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